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Organic Gardening

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J. I. Rodale, Editor and Publisher
Heinrich Meyer, Ph. D., Assistant Editor
Lloyd Pfleiger, Art Director
Sir Albert Howard, C.I.E., M.A., Associate Editor

TABLE OF CONTENTS

With The Editor ..... J. I. Rodale 2
The Pioneer: A Forgotten Factor In the Farming of the Future ..... Sir Albert Howard 6
Old Roses and New ..... J. Horace McFarland 9
Results 14
Diatoms and Diatomaceous Earth .... Edward S. Deevey, Jr. 17
Garden Calendar—July 23
Over the Fence ..... H. K. Meyer 24
Delphiniums and Larkspurs ..... G. L. Wittrock 27
Rock Phosphate ..... C. M. Linsley and A. L. Lang 31
"Sewage Sludge and Soil Fertility" ..... Cecil D. Bachelor 32
Success With Lilies ..... Romaine B. Ware 34
A Few Vegetables and What To Do With Them ..... Heinrich Meyer 40
The Milpah and Ejido ..... John C. Gifford 43
Strawberries and Their History ..... Heinrich Meyer 48
The Lime Tree ..... Robert O. Barlow 51
Reader's Correspondence 54

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With The Editor

DRY MANURE

I was called in recently to pass upon some compost heaps that did not seem to be decaying sufficiently. It was a horse breeding enterprise in which the stables were cleaned out every day and the manure-litter placed in a compost heap in the making. There was the answer. By cleaning the litter out every day it did not have sufficient time to become urine-saturated. It was an extremely dry manure. My advice was to turn the hose thoroughly on each load as it left the stable. To make good compost you must have a well saturated mass of material.

●

IS SHEET COMPOSTING PRACTICAL?

For the large farm it has been suggested that making sufficient compost is too much work. It is forgotten that on such farms the expenditure for chemical fertilizers each year is enormous and that with this money, if the use of artificial fertilizers is abandoned, a person can be hired who practically does nothing else but make compost and is on the prowl for residual organic matter which can be found here or there because the other fellow is too lazy or too uninformed to bother about it. Such a person in no time at all will become a compost specialist, an expert in this line. Then there are mechanical manure loaders that reduce the work in making compost to a fraction.

The farmer who does not want to take the plunge might resort to what is called *sheet composting*. He is in mortal fear of making compost heaps. It is too much work. So he makes compost right out in the field. He grows a crop like rye grass or clover, which is known as a green-manure crop or a cover crop with the intent of plowing it under as a fertilizer for his next crop. But compost is not complete without animal matter, so sometime during the summer he spreads manure over the fields. This is the part I do not like. Since the manure may lie for a long period before it is plowed under, there may be an important loss in some of its values.

My suggestion to the sheet-composters is to plant their green-manure crop. Up to this point I have no argument with them. But, handle the manure with more care. Make manure heaps, interlayering every three or four inches of manure with about a half inch to an inch of soil, mixed with a sprinkling of ground limestone. Thus your manure will rot under controlled conditions. I would then apply it to the land immediately before plowing under. Do not let it lie for more than a few hours if possible. Thus will most of the nutritional elements be conserved. But compost heaps give such excellent results, that a far-seeing farmer will adopt compost-making as the best method.

COMPOSTING BY THE WAYSIDE

Sir Albert Howard sends me a typewritten excerpt from a book called *Four-Part Setting*, by Anne Bridge which illustrates how the thrifty Chinese conserve animal manures. Here it is:

"Down here the going was perfectly flat, the cultivation dense; there were rough stone walls on each side of the track, and at intervals of about 200 yards, shallow depressions, some twenty feet long and roughly paved with stones, had been scooped out in it. Wayside weeds had been cut down and thrown into these hollows. Rose, who had lingered behind the rest and was walking with the pack train, soon learned what they were for. At each one the men whistled suggestively and encouragingly to their animals and one or another of the donkeys halted and voided excreta or urine; she noticed then that there was no trace of dung on the track between the hollows.

"The most frugal race in the world, and the best agriculturalists, the Chinese by this means take toll of the precious manure even of the passing beast. The traveller, knowing the vital importance of what he does willingly co-operates."

●

TOBACCO INSECTICIDES

Many a gardener believes that since some spray insecticides and fungicides are made from plants they are mild and safe to use. If a mixture is powerful enough to kill bacteria then it is strong enough to kill the beneficial microbes in the soil. Many gardeners use *Black Leaf* 40 promiscuously as a spray thinking that it contains no dangerous elements simply because to a great extent it derives from a tobacco product. Here is an item from *The Allentown, Pa. Chronicle* of April 13, 1946 which shows that Black Leaf 40 is a poison to human beings.

"Madelyn L. Davis, manager of the Allentown High school cafeteria, 'died of nicotine poisoning contained in Black Leaf 40, a plant insecticide spray, which was taken by mistake for cough medicine,' Dr. A. M. Peters, Lehigh county coroner, said today. He has issued a certificate of accidental death.

"Dr. Peters explained that the bottle which contained the insecticide was an ordinary cough medicine bottle bearing a doctor's label. The color of the contents was identical with that of common types of cough syrups and both Miss Davis and members of the family believed that was what it contained.

"Miss Davis had been suffering from a cold and apparently arose early in the morning to take a dose of medicine to relieve her cough. Shortly afterwards she became violently ill, and although a physician was immediately called, she died within a short time."

Black Leaf 40 does not act exactly in a plant as it does in a human being. In the first place when it is sprayed, a small amount of a vaporous material reaches the soil and by the time the roots get near it most of it may be dissipated, but there is no question that it will kill some of the necessary bacteria in the soil. When a gardener goes to so much trouble each year to keep building up the health of his soil, will he want to inject a negative element, however insignificant? By stressing the positive and packing humus into the soil, disease will become less and less a factor, and there will be little or no need for strong-arm measures.

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FALLACIOUS CHEMICAL FERTILIZER DEFICITS

The *Minnesota Horticulturist*, a splendid publication recently conducted a discussion on the value of organic matter in the soil. One of the participants, C. O. Rost, reasoned as follows:

"When chemical fertilizers are used properly they are not harmful. One

of the prominent arguments for 'organic' systems is that they are 'Nature's way.' If we were to adhere strictly to processes used by Nature, we would be obliged to return to the soil everything that was produced upon it. However, in order to live we must have materials for food, clothing and shelter, and this means that a part, at least, of what is produced on the land cannot be returned to it. All products finding their way to markets carry with them certain amounts of plant nutrients which do not return to the land from which they come. A part of the deficits, at least, can be met by the use of commercial fertilizers."

This is a type of reasoning frequently met with in opponents of the organic method of farming. There is never a proper way of using chemical fertilizers. If smaller amounts are used then only smaller amounts of damage result. That unfortunate lady who took Black Leaf 40 by mistake would still be in bad shape if she took ever so small a quantity of it. Instead of dying she would probably become violently sick. I am glad Mr. Rost rang in "Nature." Yes, we composters rely a great deal on the ways of Nature, and there should be more reliance on this Nature principle in agriculture. If it wasn't so sad it would be amusing to see how these chemical culturists scream their heads off that we are cultists and nature followers, as if we were nudists or something. Yet, by foresaking the ways of Nature, they have brought about such an artificial and chaotic state of affairs on our country's farms that our scientists are going crazy in finding the answers.

But let us look at the ways of Nature—Does Nature return "everything" to the soil? The answer is "No." The fact of the matter is that, excluding water, a plant draws only around five percent of its sustenance from the soil. The rest of the solid matter comes from the air, not only the air above the ground but the air that surrounds the roots. Isn't that just like Nature? She always works out a fool-proof formula. She cannot be ministering at every blade of grass, so she works out a safe system in which there is plenty of room for a local failure here and there.

It is the same with our bodies. Man really could get along with only one kidney but is given two. Man could get along with much less lung capacity than he has. This principle is widespread in Nature. Why, think of the roots of a dying crop. They alone, by decaying, probably return a very substantial part of that which was taken from the soil by the plant.

●

GOVERNMENT RESEARCH

Every once in a while we get off a letter to the Department of Agriculture asking them why they do not begin experiments to test the nutritional value of crops produced under the organic system, using compost made according to the Sir Albert Howard method as against those raised under regular commercial methods. Once we were referred to the Government Station at Geneva, N. Y. but so far no results on the effect of compost have been published. But yet, millions of dollars of the taxpayers' money is being spent for experiments which seem to try to get us further and further away from natural methods of farming.

The latest idea now is a short-cut to magic yields. Our farm advisors are not content to put chemicals in the soils, to spray chemicals around the plant while it is growing, and to spray chemicals on the harvest while it is storaging, but now they want to saturate the seed with chemicals and to extract rabbits out of hats in the form of greater yields. Here is an item from the Science News Letter which describes the experiment:

"Hopes of greatly increasing vegetable and field crop yields through chemical treatments of seeds are somewhat damped by a report (*Botanical Gazette,* Dec.) on negative results of a large number of experiments by Dr.

William S. Stewart and Charles L. Hamner of the U. S. Department of Agriculture.

"These two researchers tried a number of growth-regulating substances, including several commercial preparations intended for seed treatment, on the seeds of a considerable assortment of plants, ranging from field crops like corn, wheat and soybeans to garden vegetables such as radishes, carrots and squashes. They grew them under a wide variety of soil and climatic conditions in three places—the Department's great experiment station at Beltsville, Md., at the University of Chicago, and at Lake Geneva, Wis.

"In all cases, they report, they were unable to detect any significant increase in yield as a result of the chemical treatment of seed."

Why not start the laboratory wheels whirring in a move to ascertain whether the claims made by the composters do have a basis of fact?

●

MODERN FOOD

You might like to read an item printed in the English newspaper, The Daily Mail, of Jan 12, 1946. It was written by a Mr. N. Burchett and shows the dangerous trend in the production of present day food. If you can find the time to send a copy of this to your Congressman and Senator, perhaps our legislators will become aware of that dynamite keg of false nutrition on which our entire civilization rests:

"Those engaged in heavy manual labour, such as shovelling coal, for six years on a diet consisting of one meat meal per week cannot be expected to show anything but the symptoms of under-nourishment, ill temper, muddleheadedness, selfishness, and inefficiency . . . .

"The public subsist upon food which, originally grown on soil poisoned with chemical fertilizers, has been preserved, dehydrated, devitalized, heated, frozen, tinned, painted with creosote, stained with cochineal, or otherwise 'treated' until its nutritive value is similar to that of the 'salt horse' of sailing-ship days.

"The comparatively new idea of dehydrating food has certainly got the ancient Egyptians beaten at their own game of mummification.

"The idea is simple: Refine, condense, and dehydrate the stuff. Seal it up in cardboard, transport it a few thousand miles over the sea. Keep it in a stuffy shop for a few months, then open it up, add water, and finally cook it again to make quite sure any life-giving properties that might have survived are killed."

●

POLIOMYELITIS AND WATER POLLUTION

According to physicians one of the causes of infantile paralysis is the polluting of streams with human wastes. There is definite medical evidence to this effect. Thousands of children will become crippled with this disease each year because of the ignorance and petty politics which has many municipalities in its grip. To drink water which contains sewage pollutions would be all right for the Middle Ages, with its Black Plagues, when no one knew any better. But with modern day knowledge of the causations of disease it is grossly stupid for any town or village to dump such filth into rivers. Yet this foul practice is going on in the United States today on an extensive scale.

Check in your own city. If you find that your health is being endangered by such a practice, bring it to the attention of the proper authorities, and describe to them the advantages of composting the town wastes on a large scale. Perhaps your town may become interested in building a sewage disposal plant which will turn these wastes into sewage sludge, a valuable organic fertilizer for use on lawns, shrubbery, ornamental trees, etc. Because of the sharp chemical residues which are found in such sludge I wouldn't use it on food crops.

J. I. Rodale

The Pioneer: A Forgotten Factor In the Farming of the Future

By SIR ALBERT HOWARD, C.I.E., M.A.

WE ARE living in an age of planning—in a period when almost frantic efforts are being made to repair the blunders of the past. Farming at home and abroad has not been forgotten.

Official pronouncements on policy and actual schemes for implementing new plans for our farms have already appeared. In Great Britain organized bodies like the Royal Agricultural Society of England, the National Farmers' Union, and the National Union of Agricultural Workers have all issued clear and definite statements setting out their views on the steps that should be taken to put agriculture on its feet and to maintain this our oldest and most important industry on a permanent and prosperous basis.

That pioneers still exist and that they can be most useful even under present-day conditions will be evident from a perusal of three recent books, two the work of a landlord and one of a land worker who has become a successful farmer.

I will deal with the two books (both published by Messrs. Faber and Faber Ltd., London), which have recently been written by Mr. John Drummond, a Scottish landlord, one in 1944 and the other in 1945. The latter—*Inheritance of Dreams*—must be considered first. This deals with the slow conversion of an old family estate at Megginch in the Carse of Gowrie, heavily encumbered with death duties, at a very difficult period—the depression which set in after the war of 1914-18. The normal routine repairs and renovations on this property had accumulated: large sums had to be instantly raised to pay death duties: the introduction of a system of farming to meet entirely new conditions was out of the question because the leases of the sitting tenants had some years to run. The conventional solution of such a difficulty was to sell out, wind up the estate, and live on the balance. But Mr. Drummond is anything but conventional and bravely decided to hold on and to farm his own land on a new and original plan. The principles underlying this plan are discussed in detail in his *Inheritance of Dreams*. This is followed by a lively account of the practical steps taken to execute the plan and to overcome the many lets and hindrances which the Inland Revenue Authorities and the local War Agriculture Executive Committee strewed so lavishly in his path. But the owner was determined, come what may, to reorganize his property, to restore the fertility of the soil, to improve the housing so badly needed by his land workers, to improve the drainage, and to create a model estate into a number of small workable units. The W.A.E.C. had not the faintest understanding of the supreme value to Great Britain of such an example of a re-organized Megginch with the landlord turned farmer, organizer, and pioneer. They were obsessed by the grow-more-food policy as laid down by distant Whitehall and the need for flogging the last ounce of food from the land by artificial manures and so forth. They did not see that they were trying to kill the goose that lays the golden eggs. The system which ruled them had no

place for a modern Coke of Norfolk with new ideas, with a new and original outlook for farming, and the capacity and dour determination to follow the gleam in spite of any man's favour or disfavour and no matter the obstacles. The book deals with the course of this struggle and with its inevitable result—the triumph of the human spirit over officialdom and red tape. But the victory, like all such victories, had to be paid for—by sleepless nights, unnecessary worry, and something perilously near a breakdown. Yet thanks to the help of an exceptional staff and to the *esprit de corps* which only a real leader can ever create, Mr. Drummond won through. His policy of building up soil fertility and of re-organizing his property soon began to show results in the condition of the soil, in the yield and quality of the crops, and in the bloom of the live stock. An island of example was thus created in one of the most fertile areas of Scotland—the well-known Carse of Gowrie north of the Firth of Tay in Perthshire. In such a manner the first step in a much larger and much more audacious scheme was consolidated.

(To be continued)

Dolson

Hemerocallis Society

A HEMEROCALLIS SOCIETY is now being established. Mr. E. E. Lilly, 265 S. Westlawn Ave., Decatur 45, Illinois, has started the stone rolling. If you wish to become a charter member for the first three years, you may send in $10.00 now. We hope to discuss Day Lilies in a future issue. Everybody loves them, and the number of varieties now offered and the differences in price for these plants are equally astonishing. The range of color is limited, the growth habits and flowering periods are rather varied. Still, even among the colors announced we find such descriptions as "soft creamy pink background with an overlay of rose beige on both petals and sepals and the mellow finish of thick chamois", "Brazilian red and cadmium yellow", "deep raspberry with a purple effect". The prices range from 60 cents to $20.00 for one plant in one of the catalogues inspected. While the day lilies are not so rich and variable a group as the lilies, the field of hybridizing will attract many new growers. By joining the society or, we should rather say, by founding the society, they will come in touch with other growers and fanciers.

The Doctor — McFarland

Old Roses and New

By J. HORACE McFARLAND

MEMORIES are interesting, but are they important? We are certainly not suffering for new roses, and as I check over old catalogues and old lists made when it seemed necessary to try to get some order into commercial rose nomenclature my mind is filled with memories of those I have known and loved which are no longer in sight. If I must examine myself with as much candor as I can use on the subject, I shall have to admit that beautiful as were the old friends, precious as are the memories I have of them and their use, the new roses of this day and this time are better. The sometimes fierce and always critical light cast upon the newer roses by the reports upon them which reach the American Rose Society's office plainly indicate that we have set up a higher standard than that which existed even a quarter century ago, to say nothing of the time when Dean Hole said the word in England that would ennoble a rose commercially.

Much has depended and will continue to depend on where the rose is grown and what it is grown for. We who think well of roses for any particular climate or situation cannot always apply the critical thought to them. It happens to be the case with me that after having been in active rose correspondence for at least thirty years, and having seen literally millions of roses grown to be sold and other thousands grown only to be admired, a fair, square comparison is neither possible nor desirable. This is true not only because of the different circumstances surrounding them but because of the different ideals involved. Thus in checking over the names for the limited survey I am now making I strike one good rose which is out of sight and out of reach justly, because while it was good of its kind and in its time, it was played with commercially by certain rose merchants whose desire or ability to tell the truth was not really prominent in their doings.

New roses seem to find their way to Breeze Hill almost automatically, and I know they give us great anxiety. I am always looking for the world's best, and I have not yet found it. Each year that the overlooking of the new candidates comes along, old memories interfere too much. I remember one time I was tremendously stirred by things that were said about an old Tea rose, Safrano, which my memory insisted was all that it ought to be, and better than or as good as certain newer roses of the same disposition. This was proved out when I got Safrano plants and bloomed them right where I could actually compare them with those I had been mentally comparing. I was simply dead wrong.

A checking of old rose publications and memories bring a list of 95 varieties that seemed altogether worth while a score of years ago and before that. Right now I have been going over that list and noting in it those that are yet important for general rose prosperity in our gardens. Some that were definitely superior when I first began to make the American Rose Annual each year are only memories now, because beautiful as the individual rose is, it can be supplanted by the more beautiful "new" flower of the same sort. If I here discuss very briefly some of these items I trust I will incite others to do the same sort of thing, for after all the best rose list possible is the one that is intelligently made close to the blooming time so that it can be visually checked.

There is another reason that I must promptly cite. It happens that roses are scarce now, and will be for another year or more. There has been a tremendous demand for them, and

for various reasons, including very bad 1945 growing weather conditions, the supply provided throughout the commercial rose world was scanty. I look at a certain widely circulated catalogue coming from a very large grower who reaches out pretty well over the world for new things, and who grows in America at several places where he can get best results. The man (or woman) who wants roses in 1946 will have trouble to get what he wants, and yet he may be passing up some of these delightful older roses that I am about to mention.

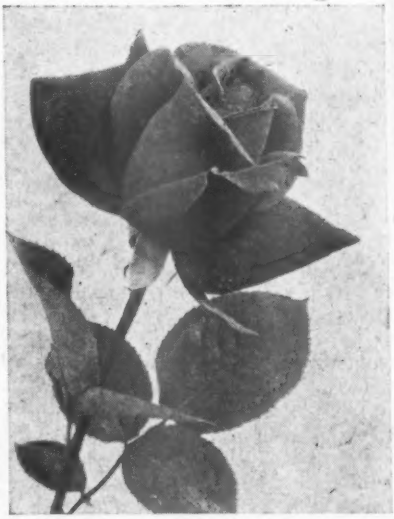
As bearing upon this general comparison I recount a visit I made some years ago to Mrs. Henry Ford's magnificent rose garden at Dearborn, Michigan. This splendid rose lady had secured the best rose woman in America, Mrs. Harriett R. Foote, to design her garden, and indeed to plant it. Both overlooked the fact that you cannot separate roses and persons with mutual advantage, and the people who had been making a good garden for Mrs. Ford did not always agree with Mrs. Foote. Therefore when I saw this splendid garden in blooming time I naturally was impressed with many beautiful roses, and, knowing Mrs. Ford's ideals, somewhat depressed that some of the newer things that I knew to be better were not there. The connection between the old and the new had not been made. As I see it, therefore, better results will follow if there is that gradual merging of old and new which can occur when sincere rose love does not do itself the disadvantage of dwelling in the past or depending upon the future entirely. (I have not been in Mrs. Ford's garden for several years, and she may have caught up with the current. I hope so.)

I do not know that what I am about to set down will be any more than casually interesting, but I do know that the old varieties I shall mention are the roses I like to live with, and indeed do live with for the most part, while nevertheless looking with somewhat experienced and sometimes very critical eyes upon the newest things that are offered as the best things. These comments are not going to be in a very consistent order.

I think of Antoine Rivoire with a memory of the great bed of it I saw when I had my first glimpse of Kew Gardens in London. I do not need it now, because as I see it there are better roses of the new varieties.

Frau Karl Druschki, about which a book ought to be written, and was indeed begun by Peter Lambert when he wrote me of how he has been prevented from calling it "Snow Queen" because the "boss" of the show he was needing to use to promote his rose interests insisted it would not be registered at all unless it was given the name of his wife, is still the most dependable white rose, though not a constant bloomer. The old, old General Jacqueminot, with which I grew up, is not easy to obtain, but nothing has surpassed its combination of deep crimson beauty and sweetness. The climbing form of it seems to be the best and most vigorous, as I might explain if I had another page or two to tell why.

The first real rose bloom I enjoyed



Mirandy McFarland

was on a plant of Hermosa, which has been dependable for a hundred years and will be for another hundred, I presume. The peculiar and individual sweetness of La France, the first Hybrid Tea rose, still endears it to us, though it is not a vigorous grower. Nothing has happened to make me lose one jot of esteem for Gruss an Aachen, the most thoroughly dependable of the polyantha type, and a true Floribunda. Kaiserin Auguste Viktoria still stands as a dependable white rose. Tied in with memories of the Druschki above mentioned are others of Gruss an Teplitz, which passed through the hands of Peter Lambert and is still uniquely and definitely dependable as a red rose that stays, and stays, and stays. To those who can grow it south of the Mason and Dixon Line, Marechal Niel takes a place of its own for yellow beauty and sweetness. Another southern rose is Mermaid, the only hybrid of Rosa bracteata we have, which, where it will grow at all, will richly reward the grower with its five-inch single blooms.

It was more than twenty years ago that I was very much excited at the then excellent trial rose garden maintained at Arlington as part of the Department of Agriculture's rose effort, where Marie Pavic was new to me and very good. As a Polyantha it yet belongs in the front rank.

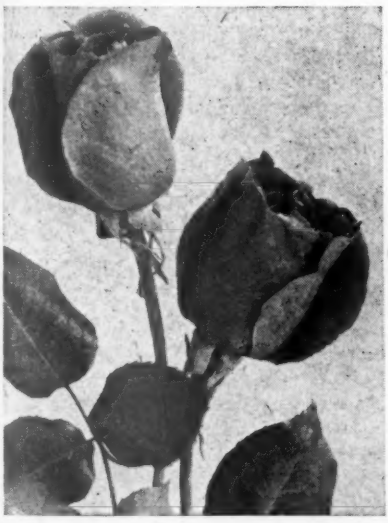
An English labor leader who once visited me and proved to be a sincere rose lover who could forget his unionism when he smelled a rose, made me acquainted with Mme. Abel Chatenay. I think of it in the same terms as I do of Mme. Butterfly, Mme. Caroline Testout, Mrs. Franklin Dennison, Mme. Edouard Herriot, Mme. Jules Grolez, Mme. Leon Pain and Mrs. Henry Morse, all of these being in shades of pink that are really good.

In this same general rank came Ophelia, which has emerged from the greenhouse and might be mentioned with Mrs. Charles Russell and Mrs. Aaron Ward, which was good and is good indoors and outdoors. I think I would mention the dependable old Niphetos which people in California or the South can have to distribute its slender white beauty.

The excitement attached to Talisman, so perfectly named, has died down, but the rose is still a grand, fine rose. I am unregenerate enough yet to want Radiance about me, as well as its sport, Red Radiance. Then I think of the stories that were printed in the American Rose Annual about Souvenir de Claudius Pernet, and while other yellow roses now are probably better, I won't worry about that.

A long story could be written about the way in which redness in a rose counts. Nothing has happened to lower the standard of Paul's Scarlet Climber since it first came out of England. Red Letter Day is just as red, but it is not a climber. Richmond, Sensation and the other red roses are good roses when you can have them, even if they don't come in the war category.

Los Angeles came to me when it was yet under number, before it had conquered the rose world through showing in Paris. Much in the same color is Louise Catherine Breslau, yet available I think. As a luxury I should



Sensation McFarland

President Herbert Hoover McFarland

want always to have Gloire de Dijon with me, though, to be sure, New Dawn can be had now and will give satisfaction, just as the rose from which it was a sport, Dr. W. Van Fleet, will always please. I do not any longer need to consider the old Crimson Rambler, which was very exciting at first and was overplanted. The new Chevy Chase has all its merits and none of its faults. To those who can get good plants, Blaze tells a story right now as it climbs. Doubloons and King Midas are others among the climbers that will give great yellow flowers, and it is these that take me from consideration of the old favorites to the new favorities, which, as I have said, you can't get, however badly you want them. Let me mention some of them, however, because the shortage will be but temporary.

Before I move over into the new roses, I must say that the patented Crimson Glory is probably "tops" among the red roses. It may develop seedlings and sports, but can hardly excell its first show of polished scarlet fragrant richness. It is a "must have".

Dream Girl makes its bow among the pillar roses, and so does Dr. J. H. Nicolas. The fine old President Herbert Hoover sometimes appears to advantage in its deep pink sport, Texas Centennial.

While I never did want a rose named for me, I have submitted more or less gracefully, first to Editor McFarland, which proves a definitely first class deep pink that stays with the grower. The variety most advertised just now as Horace McFarland is of rich two-toned beauty and has staying quality. Most interesting to me has been The Doctor, which was vicariously mine by adoption, and which on a mean plant that seems to be fond of black-spot yet does produce magnificent flowers, each of which is an event.

Among the newer roses there are some that are really red. Etoile de Hollande bridges over between old and new. Christopher Stone, Rome Glory, Mirandy and Poinsettia go with it. Zulu Queen is really a splendid dark rose which makes me think of one of the old, old varieties, Prince Camille de Rohan.

We who are supposed to justly describe roses are always in trouble when there are two or three contrasting shades in a flower and we cannot say which is dominant. That is true of the fine and vigorous Condesa de Sastago. It is also true of Girona, though in the shades. Charlotte Armstrong is a far west variety which reaches into various directions in its color range, all of them good. There are some who highly fancy Dicksons Red and Grande Duchesse Charlotte, both are really good.

Somehow one cannot leave yellow out of the rose range for very long. Among the old standards I might mention the ruggedly hardy old Harison's Yellow, as a shrub rose and that leads me to Paul's Lemon Pillar, which is not lemon but is the favorite white climber, unless I mention Purity with some preference. To me, Eclipse with its long, slim buds is a standard of comparison among yellow roses. I can add to it Mandalay, Lowell Thomas

and Brandywine with equal commendation, and as well Mme. Joseph Perraud, which shows many shades. Mrs. Paul R. Bosley comes into the picture here, and adds to it, as does Mrs. Sam McGredy. Golden Dawn takes us toward the yellow section.

When we get over to the pink side, which is surely very heavy because the rose is naturally pink, I begin at once with the two-toned Comtesse Vandal, and then touch Good News and Heart's Desire. The lovely President Macia has been neglected, but it very much belongs. From Australia we have Warrawee, and somewhere in this connection I must mention the distinct Mary Margaret McBride, McGredy's Sunset, and then Permanent Wave, about which I ought to be able to tell the delightful story of how it got its name after the Hollanders had tried to bury it as Mevrouw van Straaten van Nes.

Classed among the lighter yellow roses is the distinctly beautiful Mme. Chiang Kai-shek, as fine as the lady for whom it is named.

I have left almost to the last the rose vigorously advertised and very much under supplied because there were not enough of them. I do not know how to describe Peace, because as one looks at it it changes. Dominantly you have a tremendous broad, open yellow rose, yet at some stage of its existence it has had deep red-pink, and some petals have been in between. When it can be had it will go, and go some more.

Now all this discussion of old and new is intended to be properly confusing, because after all if a man (or a woman) loves a rose and is willing to give it reasonable nurture he is going to get something and to make his own selection or adventures. That, it seems to me, is the sound, sane and fine thing to do. If he gets into the American Rose Society he is almost sure to find some neighbor he can visit to whom he can advantageously talk roses and with whom he can exchange experiences that are both delightful and useful. One just must have experience in order to know and to enjoy roses, and everything I have written bears in that direction.

Good News — McFarland

RESULTS

POTATOES

I am an enthusiastic organic gardener, and have employed organic principles in growing crops for over fifteen years.

Last year my potatoes did better than 600 bu. per acre and I had two rows of onion sets that produced (from 5 lb. sets) over 5 bushel baskets of marketable onions; peas, corn, beans, tomatoes, cabbage etc. did equally well.

Five years ago the soil on which these were grown would get hard as a baseball, but it is getting mellower year by year.

Gilbert Johnson,
Libertyville, Ill.

COMPOST EXPERIENCE

Received my first issues of *Organic Gardening,* including your book on *Compost and How to Make It.* I am deeply impressed with your point of view toward gardening, whatever comes out of a garden of course must be replaced with some organic material to maintain its fertility.

I have been gardening for about 4 years never having grown a thing before, moving to Babylon from the City. I will say the health of my family has never been better, this I attribute to my garden produce and the back bending work that goes with it.

I have been using compost since I started with a very poor grade of soil that I had brought in, soil which would hardly grow a thing, but now I am proud of my soil, having the best and most productive garden in my neighborhood, bumper crops and tomatoes right down to frost.

G. Klein,
Babylon, N. Y.

GRAPE CURE

I appreciated your "Grape Cure" editorial. My brother and I are often affected by a disabling pain in the base of the brain and down the spinal column and have noted it particularly when using too much bread or wheat cereals. It has come to our attention that there is an ergot in many grains that causes irritation of the nerve centers, but that grapes have an element that counteracts this irritation, and we have found that whenever the nervous spell comes on, we just cut down on cereals and take to grapes, grapejuice, or raisins, and within a few hours we begin to feel relief.

Skadsheim,
Great Falls, Mont.

EARTHWORMS

You can bet that I want *Organic Gardening,* also the Book Club. I am enclosing subscription for three years to your *Organic Gardening.* And when my time is out on the Book Club just bill me for it too. Now Mr. Rodale you are on the right track and I hope you continue along this line until you close your Account on Earth. I have for several years made myself a compost pile but have never made it right until the one that I have now in the making. Just want to tell you about the little pile that I made after I read your Booklet on *Compost and How to Make It.*

I put the small amount that I had on my garden about the first of February and it was hardly enough to see that I had done so but a few days ago, I pulled my cover crop of rye which was about a foot high, I pulled and shook it and I have never seen as many angle worms in my experience with garden soil in my life.

I thank you for the time I have taken, but I just had to tell you and if there is ever anything that I can do to help just ask and you shall receive. I remain

Yours for results
J. F. Budd,
Springfield, Ohio.

SEA WEED

Last year when I was down on Bolivar Peninsula there was a great deal of sea moss washing in, so I gathered a large sack full, took it home, washed it with clear water and put it around my butter beans. You should have seen them jump. I never ate such good beans.

Chas. L. Watson,
Houston, Texas.

FOXTAIL GRASS

I had a lot of foxtail grass covering all of my lot, and found that it makes a fine cover for the compost heaps, to shave off a sod of this grass I wish to destroy, and turn the grass roots out, making a cover for the compost heaps with this sod. It is tough, and more porous than solid earth, but it takes care of the compost so that it processes right out to the surface.

H. Skadsheim,
St. Helena, Cal.

PLOWING

Concerning *"Plowman's Folly"*, the author's conception of the function of plant life is erroneous for the following reasons:

Humanity has multiplied solely on the volume of food available to feed the race, and the bulk of our food supply throughout the history of life has been based upon the annual crops. For instance, corn, wheat and oats in a loose soil will send their roots (after germination) as deep into the soil as the plant attains above the soil, and those roots in the case of wheat or small grain, measure hundreds of feet laid end on end. After the plant has reached its height through the action of phosphorus in the soil, the bloom is formed at the head which is later changed into seed. *No one ever uses nitrogen to grow wheat or small grain crops unless he is greatly mistaken in his conception of the soil. All highly nitrated grain crops will lodge, and render harvesting almost impossible.*

When the bloom is formed, and the grain starts to build in the head, the root translocation takes place; by the pulsation influence of sodium and potassium that moves the dissolved root through the stock stalk, as the blood moves through the animal body; and is converted into the food essential to life. For instance, the corn plant after it germinates in a loose soil, will linger longer building its root zone if the soil is plowed deep. The plant will linger longer before emerging from the soil.

A significant test was made in Mechanicsburg, Ohio, many years ago under the auspices of Joseph E. Wing and a man named Spaulding, who invented the deep tiller, which would plow 16 inches deep at one operation. To test the difference, a plot of land was divided into 8 inch depth plowing and 16 inch depth plowing. The same kind of seed was planted on both places and within a week the shallow plowed corn was up, but it took twice as long for the deep plowed corn to come up, and after a week of both growing, one could see at a distance of a half-mile that the deep plowed corn was passing the shallow corn.

The most efficient plowman the world has known is "Jack Frost". In the countries where the frost goes deep the best crops are raised, and in Canada the wheat yields are far superior to the wheat yields in warm countries. Frost not only moves the earth horizontally, but lifts it, and where that occurs the air and the moisture can enter. The old time farmer had to re-set his fence lines every few years because the frost heaved the posts out of the ground, and in those days the plowing was light as ashes.

M. A. Sacksteder,
Redlands, Cal.

Diatom ooze from the bottom of the Pacific Ocean, taken in 2340 fathoms by the research ship "Carnegie", (From Revelle).

Diatoms and Diatomaceous Earth

EDWARD S. DEEVEY, JR.
Woods Hole Oceanographic Institution and Yale University

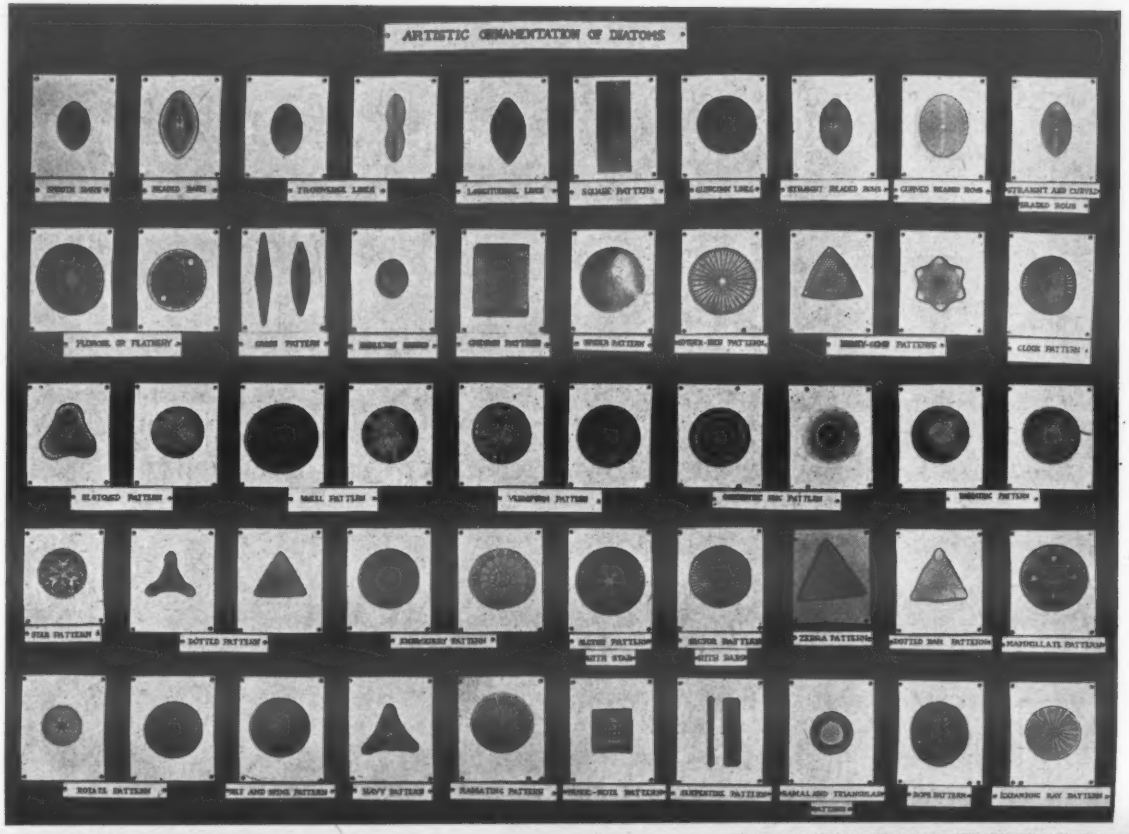
What is diatomaceous earth? Readers of Dr. Pfeiffer's interesting article on the cultivation of strawberries may have asked this question. "Britannica" fans, particularly those rabid ones who prefer the Victorian Eleventh to the Jazz-Age Fourteenth Edition, may have noticed that the "Dictionary" requires fifteen pages, while the "Diatomaceae" are disposed of in two. This tells us something about the editors of encyclopedias, but little about diatomaceous earth. In this article, speaking not as an expert, but as a biologist with some experience of diatoms, I shall attempt to answer the question to the satisfaction of Organic Gardeners.

Diatomaceous earth, also known as Kieselguhr or diatomite, is a geological formation, an unconsolidated rock, composed almost entirely of the skeletons of microscopic water plants called diatoms. So much Webster tells us. But the bare definition, unprovided even with a picture, gives no hint of the marvellous beauty of diatoms, or of their tremendous importance in the economy of nature.

Gardeners do not need to be reminded that animal life on the land would be impossible without vegetation, or that plants are vastly more abundant than animals in any large area, like a county or a continent. If we suppose, for one repulsive moment, that all the animals and all the plants on the whole earth could be gathered separately, ground into fine ensilage, and spread out evenly over the land, the thickness of plant matter would be appreciable—several inches at least; but the animal matter would be reduced to a thin film, about as thick as a grease spot. So great is the disproportion between the mass of cattle and the mass of grass, between the mass of elephants and the mass of jungle, between the mass of gardeners and the mass of garden truck, when the "standing crops" of animals and plants are computed on a per-unit-area basis.

It is easy to show, furthermore, that of the small fraction of the standing crop made up of animals, only a still smaller fraction can ever be made up of animals which eat other animals. To borrow an illustration from Elton, if fifty zebras can live on the grass produced by a square mile of veldt in a year, and if a lion requires fifty zebras in a year to maintain him in his accustomed style, that square mile will support at most fifty zebras or one lion; without resorting to a slide rule it is obvious that there will always be fewer lions than zebras. This is what biologists call the "pyramid of life", picturing the largest carnivorous animals as the apex of a pyramid of numbers (or masses), below which are larger numbers of smaller carnivores, and still larger numbers of herbivores, while the whole animal pyramid rests on the broad base provided by the plants. They alone can produce food from minerals, air, and sunlight.

But if this is true of the land, what of the ocean, which covers nearly three-quarters of the earth's surface? The plants and animals of the sea (and the same applies to a lake) make up a pyramid of life in no way different from that of the land, except that a larger fraction of the mass of aquatic life is of microscopic size. At the apex of the pyramid stand the whales and larger fish, conspicuous to us but few in numbers; below them are a host of smaller animals, most of



Diatoms

Courtesy *Nature Magazine*, Washington, D. C.

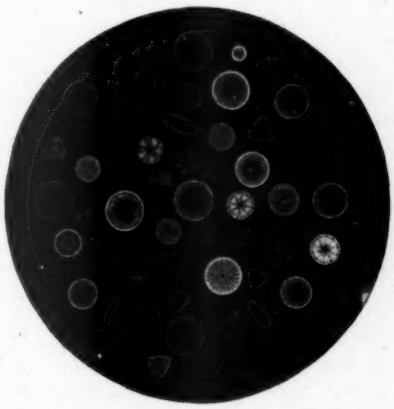
them unfamiliar except to the biologist—jellyfish, arrow worms, shrimp, molluscs, copepods, etc.; and at the base of the pyramid are the plants, the great majority of which are microscopic algae which float passively in the water, drifting with the currents. The whole floating population of microscopic organisms, collectively known as the *plankton,* is quantitatively much more important in the economy of the ocean than the population of larger attached plants and animals which we see along the shore. And of the plankton, invisible to the naked eye yet incredibly abundant when we consider an entire ocean, the larger part is composed of diatoms. Like other plants, diatoms grow and reproduce at the expense of minerals dissolved in sea water, manufacturing organic substance from carbon dioxide and water in the presence of sunlight. They are the basic crop of the sea, consumed directly or indirectly by all the animals above them in the pyramid. Diatoms are the grass of the sea; all flesh is grass, and all fish is diatoms, as Elon Jessup has put it.

I shall not treat further the relationships between different members of the plankton, or between plankton and larger organisms; for this I can do no better than to refer the reader to Elon Jessup's article, "Pastures of the Sea", in the June, 1943, issue of *Natural History*. What concerns us here is, first, how is diatomaceous earth formed, and second, what good is it?

The individual diatom is an alga made up of a single cell, much like the cells of the green algae which form the green scum on moist tree-trunks or in the surface waters of ponds in summertime. Unlike those algae, however, the diatom is not obviously green, for its chlorophyll is masked by a brown pigment. The cell is enclosed by a delicate shell, which in the different species, of which there are several thousand, is ornamented by an amazing variety of sculpturing. Because of their great beauty diatoms have been favorite objects of study by microscopists ever since they were discovered by Leeuwenhoek, the inventor of the microscope. They are used today as test objects for lenses; any good lens, even a hand lens, will reveal at least the larger diatoms in a drop of pond water, but only the finest compound microscopes can show the fascinating tracery without distortion. Basically, apart from the ornamentation, there are only two forms of diatom: round ones, shaped like a pillbox, and elongate ones. They may be aggregated into chains or star-shaped colonies.

The skeleton of diatoms is composed of silica (silicon dioxide), the compound known in other forms as sand, quartz, and certain kinds of glass. Silica is not a very soluble substance; glass bottles, for example, have been used to store precious liquids for centuries without any noticeable tendency to be dissolved away. Since diatoms are composed primarily of silica, and since they are so very abundant in the sea, it is not surprising that the bottom of the ocean, at least in certain regions, is largely made up of the skeletons of dead diatoms. Calculations show that some of these must have rested on the bottom for thousands of years without any loss of their decorative pattern.

One of the accompanying photographs shows such a "diatom ooze".



Diatoms

Courtesy *Nature Magazine*
Washington, D. C.

It was taken with a dredge in the deep sea (2840 fathoms) off the Kurile Islands by the ill-fated non-magnetic ship "Carnegie" on her last cruise. The sample was sieved to determine the relative proportions of material of different sizes, and the photograph shows the fraction with particle diameters between 0.25 and 0.12 millimeters. Most of the sample was of finer grade than this, and the ooze in fact resembled a very fine clay. Sixty per cent. of the whole was silica, however, and it is permissible to think of this amount as almost entirely due to diatoms.

It takes very little imagination to picture what would be the result if an ocean bottom covered with this ooze should, in the course of ages, be sealed in by some other material, sand for example, and then uplifted to form land. The diatom ooze would be dried out, its small fraction of organic matter (about two per cent.) would be oxidized away, and much of the finer stuff would be washed out. The remainder would be *diatomite;* its purity would depend on the degree to which the finer particles were removed during its transformation from an oceanic ooze to a rock.

Diatomite formations are known from many parts of the world, and they are of various geologic ages. One of the best known is part of the Monterey shale series, of Miocene age, in central California. The diatomaceous deposits are many square miles in extent and in places are 1200 feet thick. During the Miocene much of the western United States was covered by a shallow sea, or perhaps an arm of the sea, hemmed between two mountain ranges. Alternate phases of uplift and subsidence before, during, and after the Miocene have left their record in a magnificent series of deposits, some of them of marine origin and some laid down on land. Some of the deposits are oil-bearing sands today; the oil is the product of the decay, under rather special conditions, of marine planktonic organisms including diatoms. It is possible that in some instances the same diatoms whose skeletons now form diatomaceous earth gave up their organic matter to form oil. Evidently conditions in the interior of California during the Miocene were peculiarly suitable for the growth of diatoms, and one explanation takes account of the fact that volcanoes were especially abundant around the shores of the Miocene sea. Showers of volcanic dust may well have enriched that sea in dissolved silica and iron, both of which are necessary for diatom growth.

Diatoms as a group are equally at home in fresh and salt water, although a given species is usually restricted to one or the other. As one would expect, therefore, not all diatomaceous earth is of marine origin. Many of the most profitable deposits are the remains of fresh-water diatoms, and sometimes the raw sediment of peat bogs and shallow lakes is the source exploited. The mud of Wisconsin lakes, according to Dr. Paul Conger of the Carnegie Institution, contains from 20 to 73 per cent. of diatomaceous silica, 50 per cent being a not uncommon figure. It is only necessary to burn off the organic matter from such a mud—without waiting for nature to do it—to obtain a very pure diatomaceous earth.

As "guide fossils" diatoms are extremely useful to the geologist, for they can reveal much about the environmental conditions prevailing when the diatoms were living. Differ-

Diatom Courtesy *Nature Magazine*

ent species readily indicate whether the water was fresh, salt, or brackish; whether it was deep or shallow, large or small, fertile or unproductive, and so on. Thus diatoms have been most helpful in fixing the "marine limit" in studies of the changes of sea level during the recovery of the Baltic countries from glaciation during the Ice Age. My own interest in diatoms has been of this sort. In interpreting the conditions during the development of Linsley Pond, a small lake in Connecticut, I have taken advantage of the fact that diatoms have been laid down in the mud ever since the lake was first formed by the melting of a block of glacial ice. They show the progress of the enrichment that accompanied the filling of the lake. At present the lake "works" in summer, that is, it is rich enough in plankton to cause discomfort to bathers. The diatoms in the mud show that this condition is of very recent origin, and one may suppose that it is connected with agricultural practices on the neighboring farms; waste fertilizer, both chemical and organic, is apparently draining into Linsley Pond at present. The same phenomenon evidently occurs elsewhere; in one case which has been studied in the same way, Windermere in the English Lake District, the modern condition was heralded by the appearance of the same species of diatom in the sediments.

The study of the diatoms of Linsley Pond was undertaken by Dr. Ruth Patrick, of the Academy of Natural Sciences in Philadelphia. Dr. Patrick is not only one of the world's outstanding authorities on diatoms; she has the further advantage of being curator of the richest collection of diatoms in the country, amassed at the Academy during many years by several eminent specialists, notably Joseph Leidy.

Diatom Courtesy *Nature Magazine*

Coming at last to Dr. Pfeiffer's observation that strawberries can be grown on diatomaceous earth, I may attempt to answer the second question, "what good is it?" Its chief industrial use is as a filtering and absorbing agent. The reason for this is its porous structure, that is the presence of myriads of tiny silicious skeletons which are sufficiently odd-shaped not to pack together solidly.

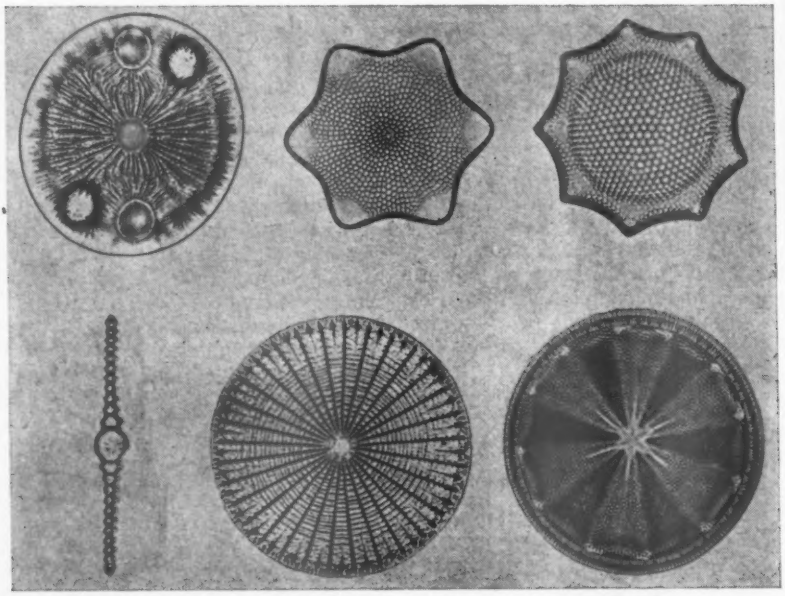
Little is known about the properties of diatomaceous earth as a soil. Offhand one would not expect so porous and mineralized a substance to provide a fertile soil unless it were greatly altered, i. e. unless it ceased to be recognizable as a diatomaceous deposit. Where diatomite occurs at the surface of the earth, as in the neighborhood of Richmond, Virginia, it supports a poorer vegetation than other soils. In many respects it is like a fine sand: diatom ooze from the ocean bottom contains about 60 per cent. of silica, some alumina (from the clay fraction), very little lime, and small amounts of sodium, potassium, magnesium, iron, phosphorus, and organic matter. On transformation into diatomaceous earth most of the alumina is lost, and the residue is nearly pure silica (about 87 per cent.) Such a soil should give an acid reaction when wet, and of course the preference of strawberries for an acid, sandy soil is well known—strawberries are the "money crop" of Cape Cod, at least they tide the natives over those long spring months before the tourists come.

The possibility remains that diatomaceous earth may have some special advantage for many plants besides strawberries. Marine organisms often accumulate substances present in extremely dilute form in sea water, and for this reason they may be our

chief source of supply for rare or obscure elements—as iodine is extracted from seaweeds, for example. Apart from appreciable amounts of iron and phosphorus, whose importance to the soil is well known, diatom ooze contains manganese, barium, boron, zirconium, and radium, and without doubt many other elements which have not been specially searched for. We are beginning to learn enough about the importance of the so-called "minor" elements in soil so that a careful study of diatomaceous earth seems to be called for.

Then too, lest I appear to be discussing "Hamlet" without reference to the Prince himself, I must not forget the silica. Silicon is required by grasses, and is taken up in large quantities by the horsetails or "scouring rushes". It probably is necessary, at least in small amounts, for all plants. It is said to promote the utilization of soil phosphorus. The silica in diatom skeletons may be presumed to exist in somewhat more soluble form than in sand, though this is not certain, and it may depend on the age of the diatoms. Certainly a wide field of research on such questions is opening up.

Amateur botanists are warned, however, that silicon is a difficult element to study, and that they can not set up a "deficiency experiment" by growing plants in silica-free solutions in glass jars. Such experiments will be vitiated by the leaching of small amounts of silica from the glass. The same objection applies to the use of supposedly "mechanical" soils, like glass beads or sterilized sand. But technical difficulties like these, and preconceived notions about the fertility of diatomaceous earth, should not hinder an attack on what seems to be an important unsolved problem. Throughout the history of science the most startling advances have been made in the face of technical difficulties and in opposition to preconceived opinions.



Diatoms

Courtesy *Nature Magazine*

Garden Calendar --- July

July is the month for cultivation and irrigation. Keep on weeding. If you throw weeds on the compost pile be sure to weigh them down with nitrogenous matter, preferably good fresh manure or chicken manure, and be also sure to keep the heap moist. If you don't, heat will not develop and the weed seeds will stay alive and cause much trouble next spring when they start germinating.

North Temperate Zone: Hoe potatoes and hill them up some, both to add more nutritious earth and to conserve moisture. Corn can be hilled some more, but be careful—its root system is easily damaged.

Roses can now be pruned, and the faded blossoms should be cut off. Summer pruning for fruit trees is indicated. See Professor Wittrock's article in the March issue. Thin out fruit, too.

Now is the time to save pits from plums, prunes, apricots, etc. for putting out in early winter or for stratifying between sand and exposing to frost. Many new varieties were accidentally discovered among seedlings. If you have enough land, start a row of your own seedlings. You will be surprised to see how different they are—some will grow rapidly, others slowly. And if the time seems too far off when you will get fruit, you can follow Burpee's method and graft from those seedlings on an established tree to see what fruit they will produce. Also make cuttings of roses and shrubs.

July is a good month for budding. See the picture in this issue. You can keep it up until September.

A good cultural means of pest control is picking up dropped fruit.

Sow vegetables for late season results: winter radish, lettuce, cress, carrots, onions, beans, beets, squash, turnip, rutabaga, kohlrabi; plant late cabbage, cauliflower, Brussels sprouts, endive, and kale. Also early cucumbers, and give a topdressing of compost to the growing vine crops and tomatoes.

Perennials in the flower garden can gradually be transplanted, especially Oriental Poppies and bearded iris. Sow annuals for later flowering, get your lily order in and be sure you get good bulbs. They may cost a little more, but they are worth it, while cheap bulbs may mean total loss or diseased plants.

Southern Gardens: Cuttings and layers of shrubs can now be started. Camellia lovers can now increase their stock; use half-hardened wood. Do it in a shady spot, also with gardenias, oleanders, roses, and pine apple guavas, those most beautiful of Southern flowering shrubs.

Sow portulaca, petunia, marigold, zinnia, cosmos, balsam, blue bonnets (lupines); the beautiful cinerarias are not sufficiently used in the South.

In the vegetable garden, you may plant a new crop of peppers and eggplants, and sow some late radishes, of which the rosy large-rooted crisp Chinese Rose and the white Straszburg are both successful.

House Plants: Now is the time to start geraniums and fuchsias, to root poinsettias and prepare for Christmas chrysanthemums. Watch the cacti for pests and water the window boxes regularly. Feed begonias and fuchsias well.

by H. K. MEYER

Over the Fence

Professor W. D. Whitcomb of the Waltham Field Station states in a folder on DDT: "Some birds have been killed by eating insects poisoned with DDT; by drinking water contaminated with it; or by contacting it on sprayed plants . . . . DDT also kills honey bees and other pollinating insects but apparently it is not so destructive as at first believed." Well, that should console the bee-keepers who lost their bees. After all, DDT is not so bad as the atomic bomb either, and if a recent report is right the caves of the United States will be investigated soon as to whether they can house war industries in the atomic age. The civilians may have to look out for themselves . . .

—o—

A FRIEND sent us an issue of the *Pacific Rural Press,* in which a report is made of Ralph G. LaRue of San Bernardino. This expert, an Assistant Farm Advisor, points out that a 2½ pound application of commercial nitrate of soda, applied in a two-foot swath in the bottom of a furrow around a citrus tree, followed by a light rain resulted in defoliation of the tree. A small amount of water produces a concentrated solution which burns the tree. With a balanced organic fertilizer this cannot happen.

—o—

WHY SHOULD PEOPLE delight so much in lording it over the rest of creation? What is that ridiculous desire to "lead" other people? It may start early, when Betty is shown off to visitors as a performer on the piano, when Dad is proud that Johnny was elected cheer-leader. But how insignificant is this group of popular fellows who get along because they know how to please everybody! How insignificant are they against the organized system of destruction that mankind has embarked upon everywhere. Nothing but tampering with nature, nothing but destroying, exterminating, and *upsetting an order that man has not created,* but that he is eager to undo. The only cure and the only salvation for mankind is this: *We must see ourselves as part of nature,* not as masters of nature. We must become modest and let other beings live. A correspondent recently wrote that he shot over a hundred robins who ate his cherries and earthworms. Well—a very wise man wrote the answer before us: "Shooting has little effect unless one wishes to continue until the birds are eliminated." He suggested that mulberries be planted which ripen with the cherries and will be preferred by the birds. But I wonder if our friend would not have got enough cherries even if the robins got some too. I always have and I have never shot a living being.

—o—

WHEN SOME RABBITS were shrewd enough to get above my wire netting that protected newly planted Prune Trees—rabbits seem to like prunes best—I was angry with them, but having made neither the prune tree nor the rabbit nor myself, I decided that I was the fool. Next year's wire will be high enough.

—o—

ORGANIC GARDENING

Our contributor, Mr. Headstrom, and his charming wife visited and Mr. Headstrom promised to contribute a book to the Gardener's Book Club on Peat Bogs and Peat Moss. The importance of Peat in gardening makes us wonder what peat is and how it develops. Mr. Headstrom, beside being a professor of science, Curator of Entomoly at the Worcester Museum of Natural History and Curator of Botany at the New England Museum, is a well-known speaker and author. When the Headstroms travel, they have with them Tiny, their wise and well-behaved dog.

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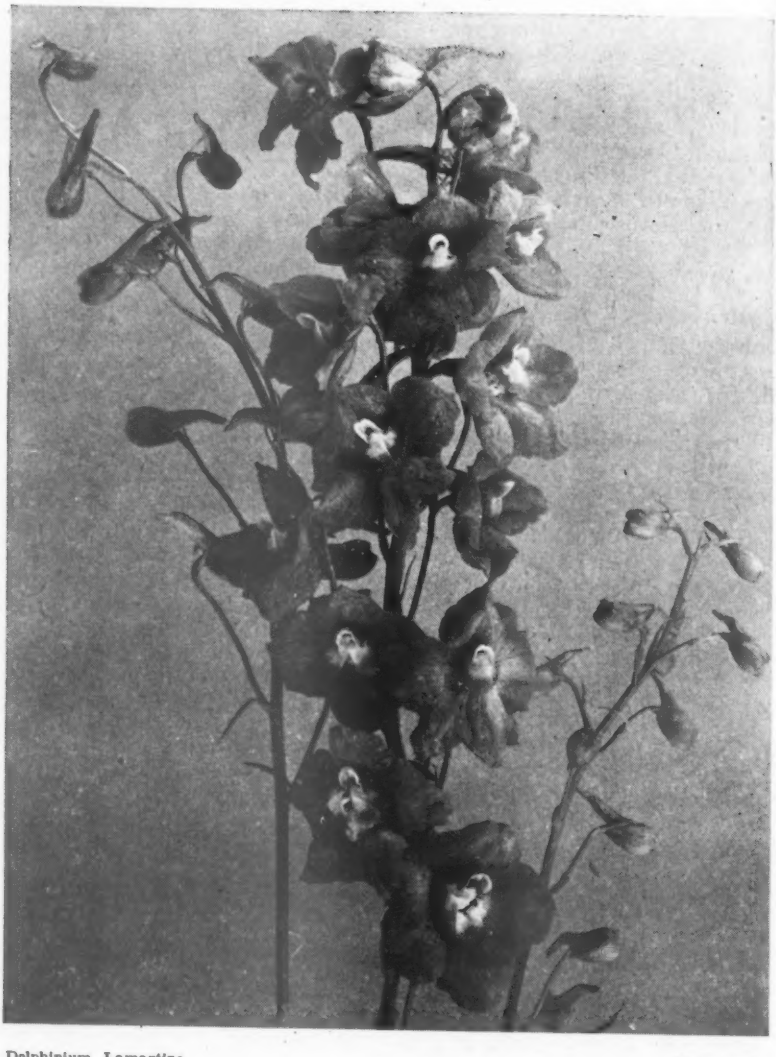
SAWDUST has been frequently discussed in our magazine. An interesting discovery was recently made by Prof. MacAndrews of Syracuse University and published in the splendid new 1945 *Delphinium*, edited by Mrs. D. N. Morgan of the American Delphinium Society. The best germination, health, growth and survival was found in choice delphinium and primrose seedlings when they were sown on coarse fresh green sawdust, from a circular mill saw with ⅛" kerf. Sawdust did not pack down and was apparently free from injurious organisms. This information is the result of a careful experiment, which should please the lumber industry from a chemurgic angle. Fresh sawdust as a growing medium for certain acid-loving plants!

—o—

TREES, SHRUBS, and VINES for the Northeastern United States is the title of a new book, published by the Oxford University Press in 1945. Its author is George Graves, wellknown to many gardeners and flower lovers as Associate Editor of *Horticulture* and contributor to other magazines. Rehder's big manual is valuable, Britton's long unavailable book on our trees is interesting, Van Dersall's exhaustive catalogue has recently been praised here. But the handy, well illustrated book by Graves, selling for $3.00, is the most practical if you want to make a choice of shrubs or trees for your own garden or estate. I just looked up some of the shrubs which I had myself recently planted on my place, and every time I found an interesting worthwhile, but concise discussion of the plant. Graves' is a book that nurserymen, garden architects, and plant lovers will want to have in their libraries.

Budding Seedling Apple Trees — Kelly Bros. Nurseries



Delphinium Lamartine

McFarland

Delphiniums and Larkspurs

By G. L. WITTROCK, New York Botanical Garden

WHAT is the most striking flowering plant in a perrenial border? Ask this question of anyone and it is surprising how many will answer: "The tall, blue-spiked flower, the Delphinium, is the most conspicuous". When you visualize a perennial border note how readily the tall, graceful, delicately tinted spikes of the Delphinium predominates the mental image. True, the Peony, Fox Glove, Anemone, Meadow Rue, and the perennial Poppy are beautiful and complete the mental picture of a hardy border, but towering above them are the handsome spikes of the Delphinium.

Often we hear people speak of the Larkspur as though it differs from the Delphinium. Is there a difference? Let us analyze the history and the meaning of the common name "Larkspur". The genus Delphinium is known in French as "Pied-d' alouette"; in German as "Rittersporn"; and in English as "Larkspur". All three common names in the different languages have the same descriptive meaning in common that the flower spur suggests the tallon of a bird; in English, the bird is the Lark; thus, a Lark's spur. This spur, in the flower, is not a petal but a colored sepal; normally, sepals in flowers of flowering plants are generally green; the Delphinium is one of the exceptions. The origin of the name "Delphinium" is quite different; it is a Greek word for Delphin and applied to the plant from a fanciful allusion to the resemblance of the flower bud to the minature head of a Dolphin. Thus the Larkspur, historically, is merely the common English name for the genus Delphinium. In this country, however, a distinction is made particularly by horticulturists. The Larkspur, to them, is the annual species of the Delphinium, and their use of the name Delphinium is applied to those species that are perennial in habit.

Delphiniums in general are of the north temperate zone and in temperate areas of lofty mountains. Some authorities speak of the group as a cold season garden plant. The 125 or more known species range in color from blue, purple, red, yellow, to white, and even in bi-colors. The flowers are simple, semi-double, or doubled.

The flowers of the Delphinium are described as having 5 highly colored sepals, the lower of which is elongated into a spur. Inside of the flower one can observe usually 2 or 4 small petals with the lower 1 or 2 also spured. The carpels or fruiting bodies are always stemless, forming many seeded follicles. The palmately lobed or finely divided leaves are also very attractive. The roots are tuberous in their structure and filled with stored food which accounts for the perennial character of some of the species of the genus.

Delphiniums belong to the Buttercup Family, Ranunculanceae, which is classed under the most primitive order of the flowering plants on earth, the Ranales. A study of the primitive nature of plant life reveals a comprehensive understanding of the difference between a perennial and an annual. What was the form of plant life when seed plants began to evolve from the seed-bearing ferns, clubmosses, cycads, and cone-bearing conifers? These early seed-bearing plants, forms of which are still existing, are easily traced and interpreted in the story of fossil records. All ancient plant life apparently was once perennial in habit, that is, plants continued their growth from year to year such as trees, shrubs, or plants that have some subterranean structure with stored food, so that the plant may continue to grow after a rest period

from year to year. Trees are classed as the most primitive form of perennial plant life, then followed in order by the shrub, next the herbaceous perennial, then the biennial, and finally the most recent, the annual. Thus all plant life had a perennial beginning, and the annual habit is most recent and a modification and specialized form of adaptation to seasonal growth.

The general horticultural definition of the perennial is a plant that develops an aerial shoot during the growing period from some subterranean root system that has survived over a drought, winter, or short growing period as under arctic and alpine conditions, and when favorable sunshine, warmth, and moisture are available, will shoot out from its subterranean bud. This aerial shoot dies to the ground when the plant has completed its flower cycle. The gardener also calls this type of perennial "Hardy herbaceous perennial" and "Hardy border plant".

The subterranean root system contains resting buds and these structures are classed as either metamorphosed shoots which are rhizomes, like those of the Iris; stem tubers, as in the form of the common potato; and bulbs, typified by onions and tulip bulbs; or the subterranean structure is a true root tuber as those found in the Delphinium. The root tuber is readily recognized from the stem tuber by the presence of a protective root cap on the end of the root, the absence of scale leaves, and particularly the failure to develop "eyes" as formed in the common potato. Carrots, beets, and dahlia tubers are typical tuber roots where the buds develop on a crown above the tuber.

Of the perennial Delphiniums, only a few species are popular in cultivation but these few have been the source, through hybridization, of the hundreds of beautiful varieties and colors now developed. These perennial species are Delphinium grandiflorum, originally introduced from Siberia in 1816; Delphinium hybridum, also originating in the mountains of Asia, and Delphinium formosum, introduced from Asia Minor. These three species have been the prolific source of hundreds of named garden varieties. A descriptive word of each of these perennial species may be of interest to aid one in identifying the parentage or strain of his collection of Delphiniums.

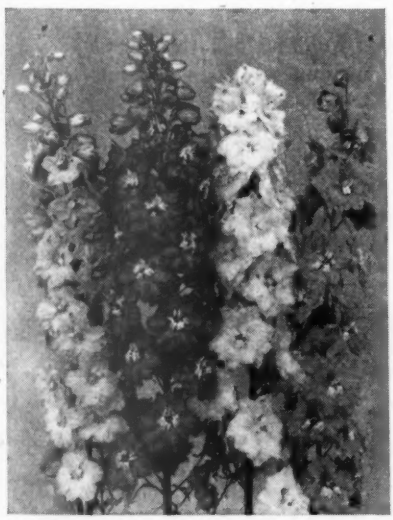
The species Delphinium grandiflorum which translated would be "Grand" or "Large-flowered Delphinium" is characterized as a plant with rather slender stems 2 to 3 feet high and with small, finely and deeply cut leaves, and bearing on the stems large flowers usually blue and varying to white, with the spur and lower petal often violet in color and the upper petal sometimes yellow. The seed pods or follicles are usually in a cluster of three, slightly hairy, and containing numerous seeds. The seeds are triangular in outline, with wrinkled coats which are never scaly or winged, a distinguishing character of many species of Delphiniums. This species includes the most conspicuous and beautiful Delphinium varieties and hybrids of the garden. Hybridization has increased its height to long flowering spikes and thus they are usually plant-

Delphinium McFarland

ed well back in the border, usually 14 inches apart. Even the foliage is attractive throughout the growing and blooming period.

The "Hybrid Delphinium", Delphinium hybridum is the tallest and most popular of the Delphiniums. Records reveal that this species has been in cultivation since 1794 and is native of the Caucasus. It is also the parent of many established hybrids. It is described as a plant 3 to 4 feet tall with leaves 5 to many parted. The upper part of the stem is usually pubescent. The inflorescence is densely blue flowered, the lower limb of each flower being white-bearded. The seed follicles are usually 3 in a cluster containing scaly seeds. There are many double and semi-doubled varieties of this species.

The other species, Delphinium formosum, which translated is "Beautiful" or "Handsome Delphinium", is a plant with a strong stem 2 to 3 feet high which is hairy below and smooth above. The lower leaves are 5 to 7 parted. The inflorescence is many-flowered, each flower being blue with indigo margins; the spur is long and violet in color. It also has a colony of 3 follicles or seed pods containing scaly seeds. This species is one of the best because of its hardy nature and is used in hybridization for this valuable hardy character. Its tendency to bicolor is an added factor.



Delphinium McFarland

The annual group, or the "Larkspurs" usually applies only to two species of Delphinium. There are many species of this genus that have the annual adaptation of completing the life cycle of growth within one growing season, the plant dying after the seeds have been developed and the seeds being the only remaining part of the plant to continue the growth the next season. The 2 species designated as the Larkspurs are Delphinium Ajacis and Delphinium Consolida. These are typical annuals but they tend to become perennial if given proper care. These species are also distinguished by having only 1 follicle or seed pod as compared to the colony of 3 follicles present in the perennial form.

The oldest cultivated species of all the Delphiniums is the Larkspur known as Delphinium Ajacis. It has been in cultivation since 1575, and is usually classed as the "Rocket Larkspur." The species name "Ajacis" originates with the slight suggestive trace in the arrangement of the petals to form the letters A.I.A., the initials of Ajax, the Greek Trojan hero. The species has been a favorite garden plant in India for centuries. The plant is erect usually 18 inches tall with a few spreading branches. The leaves on the stem are deeply and finely cut and sessile or without petioles. The basal leaves are similar but have a short petiole. The flowers are showy, blue or violet varying to white, variegated, double or single. It has only 2 petals instead of the 4 as found in the other annual Larkspurs. The species has become a weed in the United States and is found from Nova Scotia to South Carolina and west to Kansas and Missouri. Seed sown in the fall, where the winter is not too severe, will germinate and bear flowers the following May or June. Spring sowing, however, will delay

flower production until July or August. One could take advantage of this fall and spring sowing and thus have a continued series of blooms from May to August.

The other annual species known as Delphinium Consolida is generally classed as the "Candelabrum Larkspur". This species has a number of short spike-like heads of different heights. It is an erect annual about 1 to 1½ feet high with leaves quite similar to the "Rocket Larkspur". The flowers are single or double, white, blue, red, purple, or variegated, and "consolidated" or united into a compact head. Formerly, this species was reputed as a most powerful vulnerary and it is said to be an ingredient in some French cosmetics. The seeds are acrid and slightly poisonous. The species has also become a weed and is found in cultivated fields in Europe, Pennsylvania, and Virginia. Under cultivation, many varied colored combinations have been developed, and planted in massed groups, there combined colored flowers give a bazaar effect to the flower bed.

In general, Delphiniums, whether of the perennial or annual type, are planted in the fall, protected over winter either with leaves or in cold frames, and then transplanted in the spring. The perennial form are usually seriously attacked by a fungus disease which is difficult to control and eradicate. Thus the gardener rarely depends on the perennial habit of growth and always sets out new plants each year, thus assuring the presence of that beautiful flowering, blue spike of the Delphinium in the Hardy Border.

Do You Want to Help the Organic Cause?

WE ARE WORKING on a plan to enlist the aid of some of our readers who have the time to distribute our subscription-getting booklets and bring our message to an ever-widening circle. To those who are interested we will send a packet of booklets. Each booklet contains a coupon and a means of identification so that when a subscription comes in we will know through whose efforts it was, and will pay a liberal commission for every such subscription.

You can give them out to friends who do gardening or farming. Perhaps some friendly seed store, or church will aid you, or a garden club. Just give the books out—you needn't give them a sales talk, or follow them up. The booklet tells the whole story.

Write for full details to Organic Gardening—Dept Q, Emmaus, Pa., and state whether you want 25 or 50 booklets.

Rock Phosphate

By C. M. LINSLEY and A. L. LANG
University of Illinois

EDITOR'S NOTE: The following article on phosphate rock is part of a booklet published by the Department of Agronomy of the College of Agriculture and the Extension Service at Urbana, Illinois, in April 1942.

ROCK phosphate is finely ground natural rock material that is mined in Tennessee, Florida, and other regions of the United States. Most of the rock phosphate sold in this state varies from about 13 to 14.5 percent of phosphorus or 30 to 33 percent of phosphoric acid. The rock phosphate supplied through the conservation materials program contains 13 percent phosphorus or 30 percent phosphoric acid.

While the phosphorus in rock phosphate is not generally considered to be readily available, nevertheless, as demonstrated by the crop response, a part of this phosphorus is immediately available to crops. Some crops, however, like alfalfa, clovers, and other legumes, are able to utilize the phosphorus in rock phosphate better than are other kinds of crops. Because of this ability of the legumes to feed readily on rock phosphate when used as a part of the soil-building program, they may serve as farm processing plants in making the phosphorus of rock phosphate available to other crops in the rotation. The decay of organic matter may also help to convert the phosphorus of rock phosphate into an available form.

Therefore, for best results with rock phosphate, alfalfa or clovers should be grown regularly in the rotation, and an abundant supply of organic matter should be maintained in the soil by the return of legumes, crop residues, and manures.

How to Use Rock Phosphate

Because of the low cost and the slow rate of availability of the phosphorus in rock phosphate, this material is usually applied in relatively large amounts, commonly at the rate of 1000 pounds an acre. Heavier applications, such as 1500 pounds an acre, will produce greater increases and will last longer. Smaller applications, such as 500 pounds, have given substantial increases in yield on some soils, while on other soils the increases have been rather small. Rock phosphate is not effective on "alkali soil" or "shell land."

Rock phosphate is best applied broadcast by the use of an especially designed rock phosphate spreader or by the use of the old-fashioned two-wheel limestone spreader. The fan-type spreader, although sometimes used for rock phosphate, is not very satisfactory because of uneven spreading and the loss of extra fine material by blowing. Rock phosphate can also be spread with manure.

"Sewage Sludge and Soil Fertility"

By CECIL D. BACHELOR
Noted British Organic Expert

TO the average American it would seem a far cry from the main sewage disposal works to the farm and garden, but in England it is now, fortunately, becoming generally recognised that these two important factors must no longer be divorced, but brought together to exist in harmony—each depending on the other as the natural sequence of events: the final revolution in the wheel of life!

One of the largest and most up to date sewage works in the World is that run by the Middlesex County Council at Mogden and Perry Oaks, just on the outskirts of London, and deals with the household sewage and surface drainage from an area with a population of over one and a half millions. So well is this waste matter dealt with that the final effluent is as clear as tap water and the sludge is entirely free from any offensive or injurious matter.

Perhaps one of the most surprising facts in sewage disposal is that the proportion of pollution in the sewage is but one part of solid matter to 2,500 parts of water by weight, in consequence a modern sewage purification plant has to deal with immense volumes of water—in the case of Mogden over 575,000,000 gallons a day!

The sewage on entering the works first passes through the screening and grit removal plant. Here any large objects are intercepted by four inch bars and the sewage passes on through the finer screen with a bar spacing of three quarters of an inch, any solid matter then being automatically removed, macerated and returned to the sewage stream.

After passing through the sedimentation tanks, in which the heavier sludge is removed, the liquid then goes into the aeration plant where bacterial energy is brought into play, by continuous agitation in the presence of diffused air, and, in effect, the sewage undergoes the same treatment as does organic matter in the compost pile. This is then known as "activated sludge".

The final stage of purification takes place in the digestion tanks where it is subjected to a temperature of 80 degrees Fahrenheit and the Methane gas extracted. From these tanks the sludge is then pumped to Perry Oaks —a distance of some seven miles— where it goes into the secondary sludge digestion tanks and is then finally pumped out on to the drying beds.

The foregoing is but a very sketchy description of all that goes on in a modern sewage purification and disposal plant, and when one considers that a plant has to deal with such things as car tires, tin cans, old iron, (it is a puzzle to all concerned how such things find their way into the sewers) matter in solution, matter in suspension, collodial matter, etc, etc, it will be realised that a detailed description of all that goes on there would take a considerable space, and such a plant has to be visited to appreciate to the full the various processes that the sewage has to be subjected to to render it into an innocuous condition for final disposal.

What, you may ask, has all this sewage disposal business to do with farming and gardening? Where is the connection? The connection is the final dried activated sludge. This sludge—which is really compost with small vegetable content—is one of the best activators for the compost pile, and in view of the present day short-

age of animal matter it is very imperative that this sludge should be made available to gardeners and farmers for use as an activator—not as it leaves the drying beds of the disposal plant, but bagged up in powdered form ready to sprinkle on the compost heap.

There exists in some quarters an unfounded prejudice against the use of human excrement in the soil, but in actual fact sewage sludge contains a considerable volume of organic matter which is not human excrement. Think for a moment of all the organic matter which finds its way down the drain; Tea leaves, coffee grounds, paper, pieces of rag, vegetable matter, garbage and animal droppings from the roads and all sorts of things which get flushed down both the lavatory and drains. Even supposing that there was any injurious germs, or bacteria, in the human faeces, these would be entirely destroyed and made harmless during the activating and digestion process. Looking at it broadly, all that arrives at the sewage plant owes its direct origin to the soil: back then, to the soil it must go.

The chemical analysis of activated sewage sludge shows a very satisfactory content of Nitrogen and Phosphates but a deficiency of Potash, this shortage is remedied, however, when the sludge is composted as the necessary potash is derived from the vegetable matter.

Pause for a moment and look on the teeming crowds of humanity in the streets of New York, London or any large town and reflect on the fact that all these millions are parasites on the country-side. They live on the fertility of the land outside the Cities. Figure out the tons and tons of the produce of the soil which they consume every day and the soil fertility this represents. Then consider what happens to the residue of all this food when the human body has extracted certain elements from it for its own nourishment. Should it not be returned to the soil to replace the lost fertility? If not, how long can the soil be expected to continue to send its fertility to the towns? It is a point on which serious consideration must be given.

If the output of activated sludge from a population of 1½ millions is well over 20,000 tons a year, one does not have to be a mathematician to figure out what could be reclaimed for the land if all our towns were to make this sludge available to gardeners and farmers. Twenty thousand tons of sludge as an activator means three times that amount of vegetable matter—together 80,000 tons of compost a year! How many tons could be obtained from New York?

If the World is to continue to grow sufficient foodstuffs to maintain its growing population, the Sewage Purification and Disposal Plant must then be considered as an integral part of farming and gardening.

Manure and Fertilizers

IN DR. PARKER'S address on *The Nitrogen Problem*, Journal of the American Society of Agronomy, April 1946, we find a few interesting statements about the source of our nitrogen. "Legumes constitute our major source of nitrogen. They furnish far more nitrogen than farm manures and fertilizers combined." This explains why organic gardening always advocates the sowing of alfalfa and clovers. How about manure and chemicals? You will be surprised to learn that "the nitrogen returned in farm manure exceeds by 50 per cent the record quantity of fertilizer nitrogen used in the last year."

Success With Lilies

By ROMAINE B. WARE

"SUCCESS with Lilies," someone has said, "is the proudest achievement of the amateur gardener". And well may this be true. Few if any other flowers possess the wealth of garden magic found within this family. Lilies are among the rarest and most beautiful gems of the floral world. Not a few rival the Orchid in exotic grace and beauty.

Lilies, with few exceptions, have never been considered among the easy flowers to grow. Mother Nature, unaided by man, has scattered them far and wide. Over hill and dale, she has painted gorgeous pictures with them, pictures indescribably beautiful. But when we seek to bring them into our gardens, failure is all too frequent. The technic that succeeds with Zinnias or Iris, with Roses or Tulips, fails miserably with Lilies and all too few home gardeners even try to reason out the trouble. Why is it so difficult to make happy in our gardens these glories of the wild?

I think the principal reason is that we have failed to follow the lead of old Mother Nature. We have stuck to our preconceived notions of good gardening and never learned the lessons so glaringly evident all around us.

Maybe not all of us have the opportunity to observe Lilies growing in the wild. Could we all study and learn from conditions as Nature sets the stage, maybe we would find it easier to grow these treasures in our gardens.

If you will check back among the writings of such men as my old friend, the late E. H. (Chinese) Wilson, he who discovered and introduced the glorious Regal Lily, you will find descriptions of the native habitat of the different species. Almost without exception, Lilies are natives of the northern Hemisphere. For, strange as it seems, no true Lilies (genus Lilium) have ever been discovered native to the southern Hemisphere. And as they live and thrive in humus-rich waste land, obviously, they are unaccustomed to synthetic food. Many millions of gorgeous Lilies have succumbed in our gardens to over-feeding and especially to a diet of commercial fertilizers. Waste land is not necessarily barren land or desert, though in many cases Lilies grow in spots that one would never call good soil. However they are usually found to be situated in pockets where they find food elements and the degree of moisture desired.

The Lily authorities and the plant explorers who have discovered these Cinderellas of the floral world in their native haunts, will also tell you that invariably all Lilies are found growing among grasses, low shrubs and herbs, which shade the ground and protect the young shoots from late spring frosts.

Lilies are found thrusting their slender stems above surrounding foliage, their blooms in the full sun but never their base exposed. Each autumn the fallen leaves and mats of grass and ferns provide a natural mulch; which, in rotting, affords an annual dressing of just the food elements needed. Never are Lilies found thriving in bare ground. They resent situations where summer suns bake the soil surface and winter frosts fissure and furrow the ground. But how many home gardeners take the trouble to give their Lilies the desired shade?

Not all Lilies require the same conditions. Some like full sunshine while others insist upon partial or almost complete shade. L. Candidum, the beautiful Madonna Lily, takes kindly to a spot in the sun. It seems to prefer a rather stiff loam and will even

Lilium Regale — McFarland

grow in dry and hungry limestone soils. This species and two others seem to tolerate lime in the soil. Most Lilies fairly detest lime; to some it is a deadly poison. The lovely L. Martagon and L. Testaceum are apparently indifferent to limestone soils. These two are among our most desirable varieties.

All Lilies insist upon good drainage. They are short lived in wet soggy soils. Many, however, prefer a soil that is constantly moist. Maybe this seems a bit paradoxical but it is true nevertheless. Possibly you wonder how we can have a soil constantly moist but never wet? Well, here's where we learn from Mother Nature herself. The principal difference is in the humus content of the soil. The great majority of Lilies enjoy a soil rich in leafmold. And leafmold in the soil acts like a sponge that is filled with water but still so open and por-

Lilium canadense — McFarland

ous that air easily circulates through it. So it is with leafmold soils, especially if they are basically of a sandy loam nature.

Leafmold, well mixed with the soil to a depth of six to eight inches, keeps the surface open and porous. It allows air to penetrate freely and by so doing, encourages bacterial action which is so important to the breaking down of natural food elements in the soil. Open porous soil permits excess water to promptly drain away but at the same time allows a modicum of moisture to remain which keeps the soil always moist. Mother Nature who each fall adds her blanket of leaves to the soil surface is annually renewing the soil fertility.

If you can not obtain leafmold there are other forms of humus that produce reasonably desirable conditions. Peat moss is good but it must be thoroughly pulverized, almost like

Lilium Superbum — McFarland

dust and completely mixed with the soil. Don't overdo peat in the soil. One third by bulk is ample as some Lilies do not like it. L. Henryi is one for example, usually easy to grow, but in soils excessively high in peat moss, Henryi is short lived.

We have been told that the Rhododendron bed is an ideal spot for Lilies and for many it is, but if the soil is excessively peat, though it may be much to the liking of the Rhododendrons, Lilies may not be too happy. Two species, which have been especially happy among Rhododendrons are L. Superbum, the so-called Swamp Lily of eastern North America and L. Pardalinum, the Panther Lily of California.

Another factor of importance with Lilies is cultivation or maybe we should say lack of cultivation. The majority of Lilies have masses of fine rootlets close to the surface of the soil

Lilium Martagon — McFarland

and if you cultivate them as you would a Rose bush, many of the roots will be destroyed. These rootlets are vital to the bulbs. Better not cultivate at all around them. Rather, mulch liberally and carefully pull out by hand any weeds that get started through the mulch. What to mulch with? Leafmold is best. Peat moss will do and very thoroughly decomposed barnyard manure is OK. But be sure it is old and completely rotted, say three to five years old. Anything used for mulching should be light and porous, almost fluffy, because it must permit air to reach the soil and surface roots.

Following the same thought, Lily bulbs must be planted at the proper depth. This varies with different varieties. L. Candidum should be just covered, not more than an inch of soil over the bulb. Others, cover with from three to six or eight inches of soil. In

many cases we have been planting Lilies much too deep. Careful experiments in the last few years have proven this. L. Auratum is a good example. Not many years ago one of the prominent Lily dealers advised planting Auratums twelve or more inches deep so that the stem roots "which nourish the growing stems, should be well under ground." He did not realize that stem roots seldom develop more than four or five inches above the bulb and deep planting, rather than helping, actually discourages them, in fact, it almost smothers them. Today, except in very sandy soils, five inches of dirt over an Auratum is considered enough and in heavy soils, not more than four inches. This has been proven by careful planting and check planting. Some may say this is too shallow as the soil around the bulb will not stay cool. However, if properly mulched and protected with a ground cover, it will not get too warm.

We could go on and on about the different phases of Lily culture but space will not permit. One more important fact, however, should not be overlooked. There is an old story about the recipe for jugged hare which says "First catch your hare." And with Lilies "First secure healthy bulbs." In decades past we had to depend upon imported bulbs for most varieties and due to prevalence of disease, few of them survived more than a season or two. Today American grown stocks are readily available which have been grown in isolation and are relatively free of disease. The war cut off all imports and American stocks, while not plentiful, have proven themselves far superior to old disease-ridden bulbs from far off shores. But now, with the end of the war, imports are again arriving and we will have to watch out or disease will again wreak havoc not only among the imported bulbs but the disease will spread to the now disease-free American grown bulbs. Home grown bulbs are becoming quite plentiful and our best protection is to buy only from dealers who will guarantee you home grown bulbs. With few exceptions they cost no more; in some cases less than imports. In years of garden satisfaction, they cost far less.

Auratum Lily

L. L. Dolson, Cedar Rapids, Iowa

Field of Leeks — Bodger Seeds Ltd.

A Few Vegetables and What To Do With Them

By HEINRICH MEYER

IN Robert O. Barlow's *Complete Modern Garden Herbal,* so far our most richly, and fully illustrated book, the first issue in the new year of The Gardener's Book Club, high praise is awarded to the rooted parsley and to the leek, and in passing, also salsify and tuberous celery or celeriac are mentioned as to their merits and eating values. Since not all readers of *Organic Gardening* have as yet become members of the *Gardener's Book Club,* though more and more are joining, we shall here briefly point out the importance of those four: Rooted Parsley, Leek, Salsify, and Celeriac.

They should be in every garden, at least if the gardener cares for good food. Rooted Parsley and Leek can be eaten raw, salsify and celeriac must be cooked. But all four of them are all-year crops that, once sown, cause no further bother until digging time, when they can be stored between sand or plain garden earth in a cool cellar or in a pit outside. Frost will not damage them. But why should they be in the gardens and why are they not commonly known? After all, they are offered in all the catalogues.

The real reason I think lies at the kitchen end. The housewife or cook don't quite know what to do with these vegetables, which so rarely appear on the stands, and when they start their own gardens they will therefore stick to the tried and not so trying common vegetables. But that is

a mistake in this humble reporter's opinion. I think that we should grow plenty of these vegetables that one can *not* buy. There is nothing wrong with being an individualist, why care what the market stands offer if we can do better than the green-grocer?

Let us therefore see what we can do with the above four:

Rooted Parsley

Eaten raw. Grated and sprinkled on other vegetables and salads. Cooked with carrots to improve the flavor, one parsley root to each three carrots.

Cooked as a seasoning in consomme, broth, stew, pot roasts, etc.

The tender and most delicious leaves sprinkled over potatoes, vegetables, sandwiches, soups. Some are dried in the shade and then added to a noodle soup or egg soup or barley soup in winter.

Leek

The white part eaten raw like green onions. Boiled and served as a salad. Cooked and served as a delicious sweet vegetable, like boilt onions. Added as an essential seasoning to all vegetable soups and pot roasts.

Salsify

Treated like—do not shudder!—parsnips, Jerusalem artichokes, etc. as a very good salad vegetable. You clean the roots, boil them in salt water until tender, preferably after having cut them in small pieces, and serve them as a salad. Or you add meat stock and browned flour for a most delicious vegetable dish. We tried it on many visitors who had never eaten it and all of them not only said they liked it, but took second helpings.

Celeriac

Can be eaten in small quantities raw; this is inadvisable, because the fine sweet flavor and the delicate fragrance so superior to celery comes out only after cooking. Scrub the tubers, boil them in salt water, peel them, slice them, and serve them as a salad. Brillat Savarin or some other famous eater thought that celeriac increased the erotic powers of man, but we cannot find the source of this information. At any rate, celeriac salad is delicious. You may add a few finely chopped onions; but that is not necessary.

From the above tabulation it appears that these four vegetables, besides being excellent for winter storage, are susceptible to being boiled. They cannot be fried. Since present day cooking goes so much after skillets, grills, and frying pans, the old-fashioned approach of boiling may act as a deterrent. On the other hand, the housewife need not watch the simmering pot and need only watch the big helpings her family will take.

I should like to give the food values of these vegetables in calories, vitamins, and minerals. But whenever the nutrition and home economics people make analyses, they leave out my favorites and stick to the standard crops. At any rate, those analyses mean nothing since they give only an average. When a careful analysis is made of different varieties of one crop plant, we constantly discover again that the extremes of high and low mineral and vitamin content are far away from the average. Besides, if you don't like the taste of celeriac, though this is hard to imagine for me, you would not care about its nutritive value. And if you like its taste you will eat it whatever its vitamin content.

How to grow them? Nothing simpler than that if you live in the cool part of the country. Sprinkle the seeds thinly in rows, thin out in due time, and dig out in fall. Leek and celeriac will grow best in rich soil that is kept moderately moist; rooted parsley also prefers moisture, salsify grows without bother anywhere in the North. Since Bodger Seeds, Ltd. were reported as the biggest leek growers during the last few years, we approached President John Bodger on the leek question. "The leek," he says "is the National Emblem of the Welshmen, and they grow the largest leeks in the world. I have seen them six feet high and as big around as my wrist, or

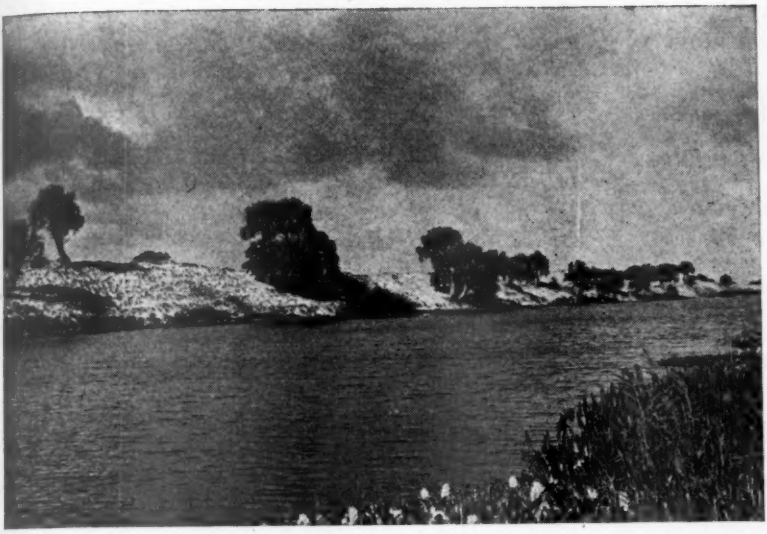
larger, for exhibition. England, as you know, is a country that is very much on the wet side, and so is Scotland, Wales, and Ireland. Onions do not thrive, but leek well grown in those wet countries is much better than an onion." On this we agree with President Bodger. Leek has the fineness of chives, the mildness of a Bermuda onion, and a flavor and sweetness all of its own. My specimens grow about a foot high and are about an inch in diameter at the base. By spacing them more widely, you can probably amaze other gardeners since transplanting and spacing will increase the size. You must then transplant leeks early from a cold frame; still, that is not necessary since the more common varieties grow large enough and are hardy in the latitude of Philadelphia and, during mild winters, much farther North. I should add that Bodger's are wholesale growers and cannot supply you with seed, but all seedhouses can.

Bodgers also produced 50,000 pounds of Mammoth Sandwich Island salsify during the last year, and you will be amazed to learn that the seed must be handpicked. So it was quite a problem. This is even more amazing since salsify cannot be grown in the warmer regions with the shorter days. After all, a good many people must have been planting salsify; for a packet of seed is about all you need to vary your menu during the winter months.

And now look at these plants as plants. The leek is a member of the lily family and a close relative of onion, chives, and shallots. Salsify belongs to the composites, like chicory and dandelion, but to that group which is perennial or biennial. Parsley and celeriac are close relatives in the family of umbrella-shaped flowers, to which so many of Mr. Barlow's herbs belong, too, for instance caraway and dill. All of them are endowed with storage organs, which means, none of them is an annual. Primitive man has, as Mr. Barlow points out in his booklet, frequently hit on a discovery later borne out by medical science; primitive man always had the further problem of storing enough food for the cold winter months. That is why he hunted for biennials with storage organs. No reason why we should not follow suit and take advantage of the storing capacities of the plants, especially now when man seems to be intent on reverting to rather primitive methods and when, for the first time in a century, the basis of existence, food, is endangered for many millions of brother and sister humans. If you have not grown these vegetables this year, perhaps you will give them a try next year; for it does not look as though the world-wide famine could be overcome so quickly. Gardening which has always been a safety factor for the hungry will become more and more a necessity for all of us and a cellar or covered outside pit with plenty of stored vegetables not only will beat inflationary prices, but give a pleasant feeling of security gained by your own gardening.

Castor Beans

GOPHERS have often wrought havoc with the gardens in the mountain states and in California. One of our readers writes that gophers will not enter a place which is surrounded by castor bean plants. If he is right, this information ought to be worth something to the growers. They can easily check up on the suggestion next year and grow castor beans on the side.



Everglades Canal with Water Hyacinths — Al Parker

The Milpah and Ejido

By JOHN C. GIFFORD
Professor of Tropical Forestry and Conservation, University of Miami, Florida

Before describing the milpah a few words about limestone regions in the Tropics are opportune. On coral keys or keys of oolitic limestone commercial fertilizers are of no value. The same fertilizer used on an orange grove in Central Florida would kill a lime grove on the Florida Keys. There are reasons for this; first there is very little soil to mix with it so that it does injury rather than good. Second, when there is no moisture it is not absorbed anyway to any very great extent and when it rains it leaches away rapidly and is wasted. Third, trees in tropical regions where the soil is strongly alkaline depend for minerals on the dissolution of the lime rock by acids produced by decomposing humus and secreted by root tips; in other words, trees actually eat their way into the rock and in so doing feed themselves on the minerals they release which must be very small since they are hard to kill by girdling. There being no annual periodicity—there is no distinct annual wood ring so that living cells of the cambuim layer extend no doubt far into the sapwood and inner bark. When you completely girdle some tropical trees even deep into the sapwood the tree refuses to die. Some like the lebbek contain a lot of soluble starch. I have some weed-trees in my back-yard which I carefully girdled six months ago and they are growing as green and fresh as ever. Even logs of such trees as Kapok and gumbo-limbo will stay green and send out shoots while lying in a woodpile. Some tropical trees when blown over send out shoots from adventitious buds in their stems and go on growing with great vigor. Some trees such as button-wood, sea-grape, cocopalm and others seem to accustom themselves to the fate which surely awaits them in the course of time. There are a lot of tropical trees growing in Salina-land which have thick corky bark around

their roots to keep out the water also leathery leaves to prevent evaporation so that the roots probably serve mainly for support. The tree must depend on dew and rain absorbed by the branches and trunks. The juices of these trees are not salt and a very thick bark on the roots prevents osmotic action. Also a lot of the vegetation of the tropics is epiphytic or grows on other plants, like the so-called "Spanish moss". It is often arranged in apartment-house formation and there is usually more above than on or in the ground.

Another point of importance is that although the foliage is evergreen it is constantly falling and in the moist warm atmosphere is disintegrated quickly by bacteria, fungi, insects, etc. Compost heaps are therefore unnecessary since the whole forest is a continuous compost heap constantly working and constantly producing proper plant food in proper proportions.

Natives manufactured gun-powder from the liquid in stable vats and cannon from lignumvitae logs wrapped in strips of raw-hide.

Nitrogen, the wine of the vegetable feast, is converted into soluble nitrogenous compounds by bacteria and mycorrhizae in the soil; also in some instances nitrogen is apparently captured direct from the atmosphere by nodules on the leaves. These are very plentiful on species of psychotria and some other tropical plants.

In other words from a physiological standpoint conditions are very different in the tropics from other regions of the globe. Furthermore when it is cold due to elevation it is always cold, when warm always warm and since there is no true annual rhythm the frost-line and the timber-line are the same.

There is no special planting time unless it be in moist weather. When the jungle native starts to grow a fresh crop of pineapples, corn, bananas or cassava he cuts a small hole in the jungle. He usually girdles the trees deep enough so that in the course of time they die. The sticks and leaves fall to the ground and termites and other bugs consume the slash. He cuts down vigorous suckers from the stump below the girdle. Sometimes he levels the slash with his machete and flashes the land with fire if dry enough to burn. This leaves a thin white film of ashes over the land which helps his young plants to get underway. He does not plow or harrow or disturb the soil more than is absolutely necessary. He seldom ever wastes his labor. These Milpahs (Mil-

Ficus Aurea choking a Cabbage Palmetto to death.

pah is the old Mexican Indian name for corn-field) are usually small in area seldom more than an acre or two depending usually upon the size of the family. The first year the crops are fine. Corn and banana plants have been seen close to twenty feet in height. (The banana by the way is not a tree. It is a mammoth herb and probably the greatest food producer of all non-woody plants.) The second year the crop is not so good and so on till it is abandoned to forest again and the native cuts another hole in the jungle. Although primitive he is conscious of the law of diminishing returns.

This has been the process not for a few centuries but for many centuries and all goes well till the population increases and too much land is cultivated so that nature has insufficient time to regenerate the soil by means of the jungle.

The old-time method of leaving fields fallow for a few years is the same thing on a smaller scale. It gives the land time to recuperate. It gives vegetation a chance to add humus to the soil and let the bacteria and earthworms get back to work before they are disturbed again by the everlasting plowing and harrowing inherited from Europe where they were forced to turn thick sod under in order to get a new crop. As you in your magazine have said, things grow well along hedgerows mainly because they are protected and undisturbed; birds drop seeds and nature proceeds in a normal way. I am beginning to believe that the Milpah system modified to meet local conditions can be successfully used in many places. As I see it it is the only system of husbandry where man fits normally into the picture. Of course, the Incas had guano from their sea-islands so that they could cultivate the same land for a long time but in general we must depend upon the hardwood forest to bring back true virginity. In many places the forest is cut and sugar-cane planted. Soon the flush of virginity is gone and the yield reaches a point where it is no longer profiitable. Rank grasses then grow on the land. It is used for pasture for a time. Then guavas begin to come and other seeds are pushed into the earth by the feet of cattle. Some trees such as mahogany are not eaten. In some cases as with the guava the fruit is avidly consumed and the seeds sprout readily after passing through the stomach of a ruminant. In time it becomes a forest and the cycle is complete.

I have read *Organic Gardening* with interest and because you have always in mind the long range productivity of the land rather than immediate gains. In the tropics this can be maintained by trees in forest formation and the native can live on tree fruits. For the first time in Florida history they are planting citrus trees in rows that follow the natural contour of the land instead of exactly east and west and north and south. Someday they will stop tearing the feed roots into pieces and may be sometime pile rocks around the tree-trunks to protect the roots, hold the trees in place in times of storm and collect the dew on still cloudless nights.

The native can have small Milpahs here and there but not too big or too many. Most of these lands are communally owned and must be properly handled because many natives are not equal to the privileges and obligations of private ownership. They know little of surveys, titles, mortgages, abstracts, etc. The proper use of privately owned land by the owner himself is probably the best mark of the highest type of civilization and the essence of democracy. The ejido system is well fitted for Indian peoples because it assures the native of land for cultivation. It fits his way of living since he has long been accustomed to the communal way of life. It breeds cooperation and if operated in such a way that only small patches are cultivated for field crops, with the bulk of the land in forest of some kind, the soil can be used in such a way as to serve the native for a long time without causing its complete ruin as has

happened in many places and is still happening in many parts of the world.

Even in northern regions where husbandry is not combined, horticulture forestry and agriculture, as in the Tropics, there should be one-third field crops, one third orchard crops and one third forest—in small patches everywhere.

In my opinion the amount of good humus in the soil undergoing proper disintegration is the true measure of fertility. Soil is no good without it and I have yet to see a place where tropical trees ever get too much of it.

Most people look upon the tropics as a wriggling, fighting mass of living things. It is however not altogether so. There is I think just as much cooperation as competition in Nature. The native is part and parcel of it. He never dominates the things around him. As long as he works with nature and not against her all is well. When the jungle is all cleared and the land bared to wind, rain and sun everybody loses. It is biological headquarters. It is quiet in the daytime but noisy at night. It is a land of intensity where many things grow rapidly at all seasons of the year. Most Northerners are not attuned to a land without annual cycles. It is hard for them to comprehend a place without winter or summer. The main rhythms are daily and monthly and they are very uniform. In some places there is a hurricane now and then but it seldom hits the same place oftener than once in a decade. This is of course an extraordinary hazard which must be reckoned with since when it hits the shore it carries with it a wall of water about ten feet above normal tide.

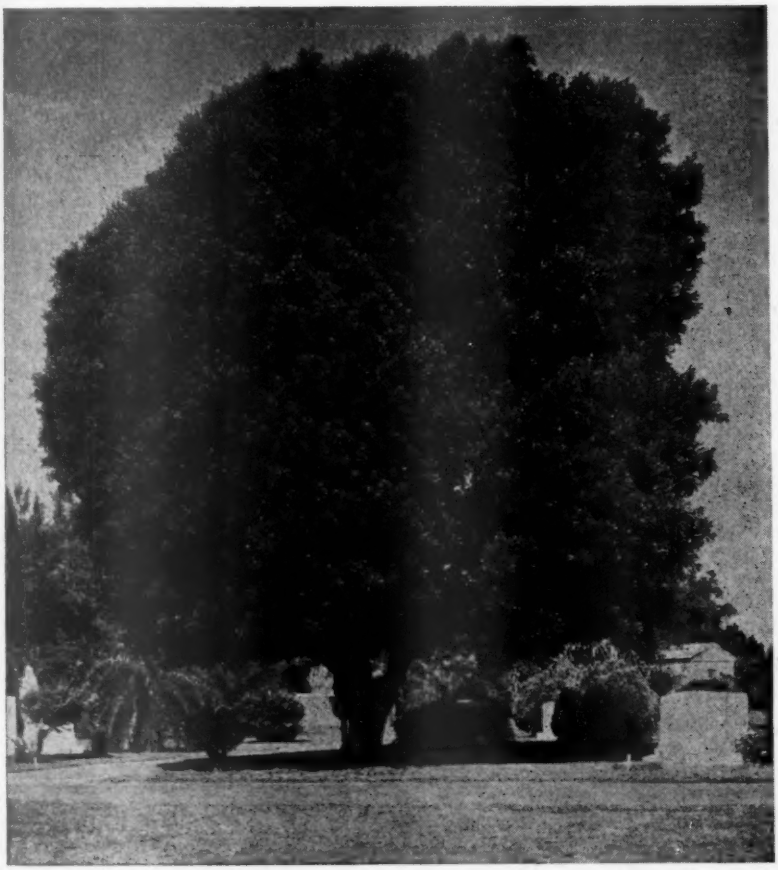
Sometime ago I was in the interior of the beautiful and fruitful island of Cuba. I was walking by the wayside when I noticed a man plowing the field nearby. When he reached the roadside I spoke to him in English and he answered in English. He said he was born in Tampa and was a graduate of a Tampa high school and that he had worked for sometime as a mechanic in a Tampa service station and garage. When his father died he fell heir to this farm in Cuba. Then I said you have the know-how, why use oxen instead of a tractor and why use a one-handled plow with nothing but a sharp point on it? His plow was little more than a crooked stick with an iron point on the end of it. He answered that you gain nothing but time with a tractor and that he had plenty of time. He said gasoline cost money and tractor parts were expensive and hard to get. When his oxen failed he sold them for meat. He had plenty more coming on. He said he used that kind of plow because he needed to merely scratch the surface of the land to produce a seedbed. He said he had plenty of avocadoes, mangoes and royal palms, the bulk of the fruits of which he fed to his pigs. He shipped nothing away in boxes to Northern markets. What he could not eat he fed to his pigs, horses and cows. He said that every royal palm on his place netted him more than a dollar a year in pig meat. He said he had plenty to eat and plowed less land each year. He said he hoped to get a hundred trees on every acre of his land with each tree yielding a dollar a year net in pigmeat and there is always a good market for pigmeat in tropical countries.

Only a short time ago I read in a Hawaiian paper that the Hawaiian Avocado Co. paid its first dividend in seventeen years. Owing to poor, costly transportation they had gone into the hog business. I mention this to show that the wise native in the tropics is not so bad off as he looks and wherever he can rely on the fruits of trees practically growing wild for a living he saves himself a lot of hard work. We go to these people with the idea of offering help mostly in the form of poor advice. We forget they have lived in that land for a long time and in the case of the American Indians many hundreds of years. We can probably learn more from them than they can from us. The bulk of settlers from abroad who move into the back country usually "go native" in a short

time and are in many cases improved by it. Many real natives are hard workers and if they can get away from peonage and exploitation and own their land do better on their diversified free farms than many Northern farmers who do a lot of cultivating, have a lot invested in machinery, have little to do in the winter and always seem to have a lot of wants and worries.

When you feed fruits to your pigs have no worry about worms or bruised fruit or over-size or under-size or poor pork and no quarrels with dealers far away who might send you a bill instead of a check. You sell your little pigs in the home market alive and if the price is too low you can carry them back again because there is seldom ever a time on a tropical farm when there is no food on the palm trees.

Value is in the man more than in the land. The Anglo-Saxon likes to dominate. — He always thinks the other fellow is very modest, lacks "know-how" or has an "inferiority complex". Even the birds that fly south in the fall are called northern birds. They are in reality southern birds that go north for a short summer visit. We call most of our vegetables northern vegetables when in reality many are tropical kinds which mature in ninety days.



Swietenia Mahagony in Miami, Fla. Circumference 7' 2", spread of crown 47', height 37'. Probably largest specimen in U. S. A.

Early Jersey Giant McFarland

Strawberries and Their History

By HEINRICH MEYER

IN his excellent work, *The Gardener's Day Book,* Richardson Wright mentions the growing of wild strawberries from seed, a method widely followed in England and wherever the exquisite fragrance of the wild berry tempts the palates of eaters of good food.

This reminds us that we should look into the differences and similarities of wild and cultivated berries, lest we overlook the fact that they are not the same. So often, the amateur imagines that the big garden strawberry developed out of the wild variety by gradual selection of the plants with the biggest berries. So often, too, he thinks that the garden berries have lost their flavor because they are no longer grown as the wild berries grew, in the shaded clearings and along the muddy and rutted lumber roads of the forests. He tries to simulate natural conditions and expects a change in flavor. It is undeniable that the soil has much to do with the form, flavor, and nutritive qualities of fruits. Still, you can never get a crab apple to taste like a Yellow Delicious whatever selections you make and whatever soil conditions you provide. There are innate differences which can be overcome by breeding, but not by feeding. Let us therefore look into the background of our cultivated strawberries. Some of the greatest experts on plant history alive tell us plainly that, "from the facts available, it is not possible to develop a clear picture of the evolution of the strawberries, possibly because too many ancestral species have already been exterminated." (Clausen, Keck, Hiesey, *Experimental Studies on the Nature of Species,* Publ. 564, Carnegie Institution of Washington, D. C.) But fortunately we know the major steps in the history of the modern garden strawberry.

Into its make-up, all sorts of native wild strawberries have entered, contributing fragrance and fertility, aroma and richness of taste, and above all abundance of fruit. The real ancestors of the garden strawberry are, however, the American strawberries—one called *Fragaria· chiloensis,* the Chilean species, also successfully grown as a soil cover by the Santa Barbara Botanical Garden, and one called *F. virginiana,* the wild straw-

berry of our own Eastern states. According to Darrow of the Bureau of Plant Industry, the Chilean strawberry was taken to Europe by a French officer in 1714. After a six months' sea voyage, he still had five live plants as he arrived in Marseilles, France. The Eastern U. S. kind had already been brought to Europe previously. Now a strange thing happened, which is tied in with the flower arrangement of the various strawberry plants. We cannot discuss the details here, but it is sufficient to say that some strawberries have only male parts, others only female parts, others both, and again others sterile parts. The Chilean berries were without fertile pollen and thus were pollinated by the North American plants. This happened, as Darlington, the famous British geneticist, says, in 1790 in Brittany, on the French coast. It was an accident of nature.

Then the breeders stepped in, especially in England and also in France, and later in Germany and the United States, and improved the hybrid further, putting in more Chilean blood, breeding for a while with the native European berries, and gradually widening the range so that now everywhere in the United States, from Alaska to Southern California, from Florida to Maine, some strawberry variety can be grown successfully. The interesting story is told in detail by Darrow in the Department of Agriculture *Yearbook* for 1937. It is particularly amazing to learn from him how disrupted scientific memory is. Time and again, the simple principles of flower formation were forgotten and rediscovered. The same happened with the sexuality of plants, a fact well known to antiquity, and lost until about 1700. The same happened with Mendel's observations and calculations in the 19th century. And between these two important lapses of scientific memory was the one concerning the sex life of strawberries. In 1760, a 19-year old Frenchman, Duchesne, had written a 400-page book which gave all the facts. By about 1834, Longworth in Cincinnati, Ohio, had to rediscover them all over again. Not until breeders realized the structure of strawberry plants could they successfully transfer pollen from one to another group.

In our own time, research on the cell structure of strawberries has added a final touch. Plants of the same number of chromosomes or dye-bodies (discussed in previous articles in *Organic Gardening* and in our booklet on *The Fruit Orchard*) do not always interbreed successfully. The European variety, *Fragaria viridis*, which grows on sunny slopes in warm regions, has the same internal structure as our American berry, but when crossed with it does not always produce fertile seeds and fruits. Modern experiments have cleared up most of the troubles, but even here some faulty records produced new confusion. Some experiments were made and reported, but the names given the strawberries were mixed up, and wrong conclusions were therefore derived from the experiments. It is only now, after the publication of the *Experimental Studies* by Clausen, Keck, and Hiesey, referred to before, that we really know how these berries are related and which of them were recently crossed and bred.

Private individuals have played a great part in this breeding work. One, A. F. Etter of Ettersburg, Cal., was especially successful in crossing wild and cultivated varieties. But since the 1890-ies, strawberry breeding has been taken over mainly by government scientists and tax-supported stations of the States and the Federal Government. The technical problems involved are not great provided the facts which have been established about flower form and chromosome numbers are watched. A man could spend a fortune by trying to breed two plants that are unreceptive to one another. A man could make a fortune by breeding a berry as large as our best garden berries and as fragrant as the original ancestors of it; it is true, we have excellent berries of fine flavor in

the North, but the berries growing in the Southern regions are, as a rule, not quite so aromatic. There, the problem of getting a hardy or at least sturdy fruit which does not melt in the crate was more important than getting a berry that melts on the tongue.

This is an important factor that is often overlooked by the experiment stations and advisors. If you grow berries for sale, you want a hard berry that keeps and looks reasonably good. If you want berries for home consumption, you could very well choose a softer berry of finer flavor. But such berries are not so easily obtainable in the warmer regions of the country, since our breeding is more or less devoted to merchantable berries. Whenever I think of Minneapolis, Minn., I also think of the most delicious strawberries I ever ate. I bought them on a hot summer day at a large roadside stand somewhere near Lake Minnetonka and I still can taste that divine flavor. Never since have I bought luscious red berries of equal taste. And, to be truthful, never have I been able to grow any like them.

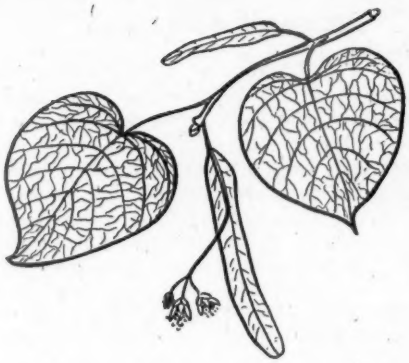
Thus we may well heed Dr. Pfeiffer's advice about soil conditions. They are not everything, but they must make a considerable difference. They do make such a difference, for berries taste different in different parts of the country, even if they are of the same breed. Yet, berries of different hereditary origin taste still more differently.

Fertility and Root Rot

IT IS ALMOST INCREDIBLE to see how quickly modern plant research advances. Almost every issue of the *Journal of Agricultural Research* relates a new illuminating experiment. In the February 15 issue Frank Eaton and Neil Rigler discussed root rot in cotton and corn. It was shown that a good carbohydrate balance in the plant made the disease innocuous or produced renewed health in the plant. This balance was achieved by proper nitrogen fertilization. This makes us think that moist years, when nitrogen leaches out rapidly, would be years of increased fungus infection. And so it is. If nitrogen is applied in organic form, it remains longer in the soil; compost leaches out less quickly than a supply of nitrate. This then would explain (or at least help explain) why compost-grown crops are more disease-resistant.

The Value of Straw

L. E. THATCHER of the Ohio Experiment Station recently figured out the cash value of straw. Where straw is burned, valuable organic matter is wasted and fertility is decreased. Straw is rich in potash, but it also contains nitrogen, the most expensive and important plant food. For each ton of straw burned, about a dollar and a quarter's worth of nitrogen goes up in smoke. But we should really cease to look at fertility as a mere cash proposition; it is a matter of conserving national resources and human health.



The Lime Tree

By ROBERT O. BARLOW

AMONG the oldest remedies for coughs and colds is linden flower tea. When spring comes and the bees start buzzing in clusters around the flowers of the lime or linden tree which permeate the air with their sweet honey fragrance, everybody with any instinct for nature must inevitably feel: Here is something which is good and wholesome. No doubt, this is the original cause for using the linden flowers, fresh or dried, as a source for teas. Then it was soon discovered that this tea had a soothing effect and its reputation was made among herbalists.

There are two European lindens which are used for teas, the large-leaved and the small-leaved linden. They differ, of course, from the American species, which mainly go under the name of basswood, but the American lindens have the same effect as their European relations. As so often in plant history, the West Coast differs from the rest of the country. Linden trees are not native along the Pacific. This teaches us something. The linden is not a tree that could surmount the Rockies and get a foothold beyond; the seed was apparently not carried across either. Yet, lindens are among the sturdiest and most long-lived trees known. Many a tree has survived, often as a hollow shell whose soft center has rotted away, but whose living outer parts support a spreading crown. I have seen trees so hollowed in which a dozen men could easily gather, and there is no doubt that under such venerable trees our forefathers may have gathered and made merry in festive dances with our foremothers.

Some of the European pharmacopoeias still retain linden flowers as an official medicine. These flowers have a pronounced effect on our sweat glands, and a single cup of boiling water in which a teaspoon or so of dried flowers has been steeped will rapidly promote perspiration and start the system back to normal. It is remarkable that some flowers have that sweat-producing power and I have often wondered if it is not largely due to the pollen. The body receives a certain shot of foreign protein in a cup of such tea, which may well be the cause of the stimulation. But nothing is definitely known on the

interrelations that develop, though the facts are undisputed.

Among the Slavic nations the linden is no less a national tree than among the Germanic races. In some parts of Bosnia, among the Southern Slavs, lindens were considered sacred and not ever given to the axe. How far back this veneration goes appears most readily from the names associated with some of the oldest lindens. Those names are often names of the Irish missionaries who brought the doctrines of Christianity to the heathens of Europe. And to this day, no other tree is so often a place of devotion giving shelter to a little shrine before which passers-by may kneel for a silent prayer.

No wonder, then, that this hallowed, stately, and lovely tree obtained also some unjustified attributes. At one time or another, here or there, some of its parts, be it leaf, seed, wood or the fibrous bast, were considered useful for some medical purpose. Nowadays, the linden wood is used for drawing coal, because it is soft-textured; it is a favorite for wood sculpting too. And the bast can be used for tying the eyes of roses to the understock, in the same way as raffia, the bast of the raffia palm. But the most useful of these is yet the medicinal quality of the flowers. For, different from strong-acting chemicals, linden flower tea acts gently. And, if taken more or less regularly, the system becomes adjusted to it and linden tea may become a pleasant drink, sweetened with honey, and fragrant with spring.

Reflections — Dolson

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Reader's Correspondence

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GREEN GAGES

Q. What is the difference between Green Gage and Reineclaude?

O. H., Oakville, Ontario, Canada

A. Green Gage is the wider term, Reineclaude is one of the green gage plums, which got their name from the Englishman who introduced them from France in the 18th century. A variety recommended in the U.S.A. is Jefferson, but in England that has been found wanting. It might be worth your while to look into the John Innes Bulletin No. 1, available at 2s 6d, and to consult with the Dominion Experimental farm at Guelph, Ontario.

—o—

PEST RESISTANCE

Q. I am at a loss to understand how compost can keep insects from devouring the leaves, etc. Has that been proven?

Dr. N. P. S., Devon, Pa.

A. Yes, in quite some instances, which we reported in *Organic Gardening*. Proper nitrogen and potash fertilization, such as should be supplied by compost, increased resistance to several fungus and insect pests. Orrin Hale of *Northwest Gardens and Homes* made a similar report, and *Science* gave out Experiment Station news about New Zealand Spinach well-fed with nitrogen being resistant to thrips. The explanation is more difficult, but it is a fact that fully fed plants are more resistant. This would explain why fungi and bacteria can be resisted by a plant grown in good compost. The fact that insects stay away from it must be related to the chemism of the insects: They relish specialized food crops and must be able to distinguish tastes rather finely; apparently well-fed plants do not appeal to them. However, there are other factors, especially with fruit trees. Certain varieties are pest-resistant, others are not, and here the method of grafting exaggerates the weakness that might disappear in seedlings. The fact that nowadays most trees are not seedlings, but grafted trees, may account to some extent for the growing pest problem. Still, Northern Spy is resistant to Woolly Aphis, and Dr. Lewis at Merton found ten apples fully or almost fully resistant to Red Spider; since several of the resistant varieties were triploids and since triploids have thicker leaves, pest-resistance may be also a matter for the breeder. How far compost increases the thickness of leaves has not been investigated. I believe that all known facts of resistant plants grown with compost were collected in *Organic Gardening*, but the reasons are still a matter of speculation.

—o—

STRAW IN COMPOSTING

Q. On the vacant lots near us we have a great quantity of weeds and grass. As I cannot find time during the summer months to get all the composting material I would like to have, I am planning to use the same weeds after they have turned yellow in late fall. Is that satisfactory?

A. G. B., Delight, Md.

A. There is a difference. While the weeds and grasses are green they con-

tain more nitrogen than when they have died. Also other plant food becomes shifted around, some of it going into the seeds. Thus the straw will be depleted of important nutrients. If you *must* use straw and dried material it is therefore necessary to make a heavier addition of animal matter, preferably fresh manure; and it is also necessary to wet the material well in building the heaps and to cover it sufficiently with earth to weigh down the loose plant matter to produce heating. A recent series of experiments in New England, about which we shall shortly have a report, proved conclusively that straw should be cut up before going into the compost heap so that quick action is insured. The same is true of dried-up grass and weeds. But if you could cut the material while green, perhaps going over those vacant lots with a scythe or sickle, you'd get much more valuable compost.

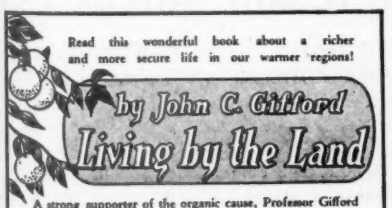
—o—

QUINCES

Q. I used to enjoy quince jelly and wonder if I could grow quinces here. How large do the trees grow and how long will it take us to get fruit? Can you recommend a variety?

Mrs. O. P., Reading, Pa.

A. There is no reason why you should not plant a few quince trees. They do not grow very fast, but should give you fruit in about five



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years. While it is possible to obtain dwarf quince trees that make a slower growth yet, I should advise your planting standard trees, preferably Wayne County Orange, which was introduced by Kelly Brothers. It is a good producer that ripens in early September. It will grow to a height of ten to fifteen feet and make a beautiful crown. The growth habit of quinces resembles that of apples, with a spreading crown, rather than pears. When you receive a 2-3 foot sized tree, do not overdo the pruning. Quinces are easy rooters and to cut out the leader to cause spreading of the crown is highly inadvisable, since quinces naturally branch out abundantly.

—o—

TO HOE OR NOT TO HOE

Q. If plowing is not good for certain farms, could it be that hoeing is not advisable on certain soils or with some crops?

J. A. B., Gulfport, Miss.

A. It so happens that the John Innes Horticultural Institution of London, England made careful tests on a light sandy loam after it had been treated with twenty tons of manure per acre. They grew lettuce, cauliflower, and carrots 1. on plot not hoed or weeded; 2. on plot hoed once a week; 3. on plot not hoed, but weeded once a week. They did this for consecutive sowings and in different years and found that

a. the crops on land that was neither hoed nor weeded were often less than a third of the crops on either hoed or weeded land.
b. that hoeing and weeding gave earlier crops.
c. that weeding alone was as good as hoeing, sometimes even better.
d. that weeding was absolutely necessary and could be best accomplished by hoeing.
e. that elimination of weeds was the essential feature, not loosening the topsoil.

—o—

LEGUMES

Q. Do you advocate the planting of a cover crop of legumes in the garden?

J. McA., Dallas, Texas

A. Under Dallas conditions, no. You can grow some other crops practically all the year around and need not look for a special cover crop. Under certain conditions farther North, a cover crop may be recommended even in the garden and I myself have occasionally thrown out some field peas after the last crops were out. They made a nice growth before the killing frosts and then could be dug in with the fall spading. Where conditions are such that the land dries out during the winter, a cover crop of

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winter rye is probably most practical, since there is no sense in starting a tiny growth of clover late in the year.

—o—

WEED NOT?

Q. A man dug up a small piece of a neighboring lot and planted the seeds of vegetables as the Indians did. He claimed he had no trouble with insects and had fine vegetables, but did no weeding. I planted some left-over cucumber seeds on the farm in Connecticut and then forgot all about them. Later when I walked down in that direction and saw some leaves sticking up through the grass and weeds, I discovered fine healthy cucumber plants and the biggest cucumbers on them that I ever saw. I pulled then up all the weeds and the plants were all eaten up and never had a decent cucumber on them.

E. J. M., Jamaica, N. Y.

A. Like everything extreme, the "Weed not" advice has some truth to it. Under natural conditions, plants do not grow in monoculture and thus escape pests more easily. On the other hand, cultivated crops can, as a rule, not survive without cultivation, even if a fast growing cucumber or melon may do well on a naturally rich soil without further attention. But try to grow cauliflower or tender asparagus without weeding—it cannot be done. And try to follow the weed-not system year after year—it cannot be done either. The non-weeding lazybone takes advantage of natural fertility stored up in years, but when competition of quick growing crop plants starts, the soil becomes quickly impoverished and must be composted, dug, and weeded. Otherwise the weeds will thrive and the cabbages fail.

—o—

HARD-PACKED SOIL

Q. The soil I have here packs so badly that I do not have the success I had at my former home in Western Washington.

Mrs. E. S., Long Beach, Cal.

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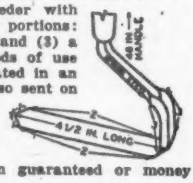

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—o—

TULIPS

Q. What is the difference between Holland Tulips and American tulips? Should I place my order in summer or is it best to order from the fall catalogues?

G. L., Colorado Springs, Colo.

A. During the early stages of the war, tulip growing was taken up in this country, partly by experienced Dutch growers, partly by established nurseries with long experience. A good deal of the propagating stock of tulips comes from Holland and it must be said that the Dutch growers kept on developing new tulips during the war besides propagating stock that had been developed previously, but not yet reached the American markets. Many new varieties will appear in this year's fall catalogues, and while you may get an advance order in to avail yourself of the usual discounts granted on such orders, I myself shall wait and make my choice from the fall catalogues. I derived much pleasure

NOTICE TO READERS

The ORGANIC GARDENING Magazine does not accept advertisements of chemical fertilizers or other fertilizers which we feel are too strong for the land or poisonous sprays. We do not deny firms access to our advertising columns if they handle chemical fertilizers if they have another acceptable product to sell. The reader should be careful in accepting such advertisements. Our responsibility extends only to the product advertised in our magazine. It does not extend to all of the products handled by a concern.

ORGANIC GARDENING Emmaus, Penna.

from the various striped tulips, Rembrandts, Parrot tulips, and other unusual kinds displaying unusual shapes and color combinations and plan to have a bed of such bizarre plants next year. Each one is a surprise, and since tulips can be admired as individuals even when planted in masses, I am going to give myself some such surprises.

—o—

PLANTING AND COMPOST

Q. I have six acres of woodland with plenty of leaves and a neighbor has offered to supply me with manure. Could I use a mixture of these materials immediately? I would like to set some grape vines, black raspberries, and fruit trees in addition to starting a small garden. The soil in this region has a layer of topsoil over red clay which dries out easily into a hard grey crust.

Mrs. R. H. L., Vienna, Va.

A. I should not use the material in raw form in the vegetable garden in spring, though in fall it would be all right to incorporate it in the soil because the material will break down through the winter. But my advice is this: Use manure and green matter such as you can find, e.g., weeds and refuse, to build a compost heap. But plant the fruit trees in the soil as it is and make a mulch of leaves and woodland top-soil around the trees, after applying a collar of chicken wire or the like for protection against rodents. The matter of compost near the roots will be discussed in an early issue of the magazine. With the black raspberries it is feasible to incorporate leaf mold and rotted manure right in the planting row. But they too, like the grapes, will benefit by an additional mulch on top. With all berries and fruits, which are, after all, slow-growing perennials, mulches are important; these plants do not require quickly available food until they become of bearing age, in fact, they may be hurt by too much fertility and make too much wild growth. Compost can be given to them after they have reached bearing age and it is sound practice then to apply it as a mulch.

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ALUMINUM

Q. Our soil has a trace of toxic aluminum. What should be done about it?

Mrs. F. R., Tripoli, Penna.

A. Aluminum occurs, of course, in most soils. When it is excessive, you want to create in your soil what is scientifically described as "buffer effect" by incorporating organic matter. Spading under a cover crop and applying goodly amounts of compost or, if unavailable, some other source of organic matter, such as Hyperhumus, Peat Moss, etc., and making use of mulches wherever feasible will balance the soil minerals and allow you to raise successful crops.

—o—

PROPAGATION OF AZALEAS AND ROSES

Q. I have a few azaleas and roses in my garden and would like to know how and when to make slips.

W. F. S., Franklin Square, N. Y.

A. Both are propagated almost anytime during the active growing season. You make a cutting of this year's growth, preferably a bit below an eye or bud, and set the cuttings in moist good garden earth or in a mixture of sand and sphagnum or peat moss, keeping it shaded and moist. If you take cuttings from the woody growth of last year you follow the same procedure and keep a mulch of peat moss on top. Without any further trouble you will get about a third of your cuttings to grow, and if luck is with you, you may get even more to sprout. Shade is most essential.

—o—

CAMELLIA SOIL

Q. Could I use Compost for growing camellias?

Dr. F. S., Miami, Fla.

A. You can, but make compost without the addition of lime.

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MILORGANITE

Q. What is your position on Milorganite and similar products derived from sewage disposal plants?

S. E., Detroit, Michigan

A. We have always advocated its use on lawns and ornamentals, but have recently concluded that sewage products can be well used with all other garden crops too if they are first composted. Sewage Sludge is, if ground up, quite a good source of nitrogen for the compost heap and care must only be taken that the heaps are kept moist so that proper action takes place. Sometimes, however, chemical wastes may be in sewage products.

—o—

NIGHT CRAWLERS

Q. Night crawlers are ruining my lawn. But I hate to destroy animals that might otherwise be beneficial. What is your advice?

G. G. C., Little Rock, Arkansas

A. Night crawler is a term that seems to mean something different in various parts of the country. In some regions, it applies to earthworms; in others, it seems to apply to certain crabs which erect considerable structures in moist spots by building air holes above rain water level. If you have earthworms, let them crawl and keep the lawn a bit longer so that their castings will not become apparent. If you have crabs who act as construction engineers, there is little you can do unless you drain the wet spots. By getting the topsoil looser, using a topdressing of compost before re-seeding, you can make living conditions for them rather unpleasant. They will quickly look for harder ground to engage in their customary activities safely.

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ORGANIC GARDENING — EMMAUS, PA.

HOW DOES COMPOST LOOSEN THE SOIL?

Q. We have a clay soil which becomes very hard after a rain so that it is hard to loosen with a hoe. If I mix compost in it, how does it change conditions?

Mrs. J. J. H., Hancock, Michigan

A. Organic matter (compost) worked into the soil will improve the granular structure and check the baking effect after a hard rain. An inexpensive method of lessening the packing of the soil in the manner described by you would be to mulch your growing crops in the garden with leaves, which would hold off the strong rays of the sun from the clay soil after a heavy rainfall, and later on you could work the leaves into the soil to provide organic matter. Next Fall sow some grass that can be turned under into the soil the following Spring, and gradually build up the organic content of the soil.

—o—

COLDFRAMES AND COMPOST

Q. Do you advocate the use of compost in coldframes?

R. N., St. Paul, Minnesota

A. By all means! When you make your bed next spring and have dug the soil, you add about two to three inches of well-broken down compost and stir it in with the upper three or four inches of the soil. This will make an excellent smooth seed bed for vegetables and annuals. While compost may be too rich when used unmixed in a seed flat inside, where light and air conditions are not always easily controlled, a mixture of compost and topsoil in the coldframe never gives any trouble. Be sure to have good compost stored away and out of the rain that would leach it, so that you can get it in February or early March when you prepare next year's coldframe.

HOW TO GROW HORSERADISH

Q. When I buy prepared horseradish it often seems to be without flavor. I'd like to grow my own. How do I go about it?

P. O'F., Milwaukee, Wisconsin

A. You can get dehydrated horseradish of good pungency until you have grown your own. Nothing simpler, though, than ordering a few roots next spring or getting them right now and placing them horizontally in the ground, the thicker end a bit higher. Space them about a foot. Horseradish will make a considerable growth and can become quite a weed if you do not watch out. You can dig them in fall, but it may be better to give them two years to get big sturdy roots. They can stay out over winter. The best soil for them is a good loom, but they will also succeed in clay soil if it is loosened by the addition of humus.

NURSERY PRICES

Q. We have received four or five lists from different Iris Gardens, Hemerocallis Gardens, and other such establishments. The prices run as high as $25.00 for a single item. What do you think of that? How much should I pay for a good iris?

O. D., New York City

A. Personally, I should never pay $25.00 for an iris. While I like to experiment, I shall not do so with new introductions that I have not even seen. In my opinion, no iris or hemerocallis is worth that much, and most of the reliable growers seem to think so too. If you cannot make your own choice, go to one of the regular mail order seed and plant houses that have advertised in our pages. In the hemerocallis field, you may want to look into the new introductions of Dr. Stout of the New York Botanical Garden, which are handled by the Farr Nursery Company in Weiser Park,

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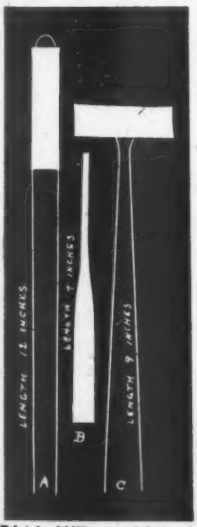

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Pa. While we usually do not print such recommendations, it is necessary to call attention to this highly reputable firm because they handle the results of the best hybridizer.

—o—

BATS

Q. Do you think it wise to encourage bats?

Mrs. M. W., Pittsburgh, Pa.

A. Bats are the most maligned animals and yet the most helpful creatures for the organic gardener. One of the reasons why insects are on the march is the foolish extinction of bats and the equally foolish destruction of possible living quarters for them. Formerly, there were enough hollow tree trunks, belfries and caves in which bats could live during the day and from where they could sail forth at dusk to catch tens of thousands of insects; modern "beautifying" practises have done away with many of their domiciles. I recommend your keeping them out of the house, but making provisions for them otherwise, preferably in a barn, smoke-house or similar structure which can be easily entered. They will help you greatly in keeping the fruit trees in good shape.

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